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STEAM TURBINES.

Nearly every reader of the history of inventions knows that an elementary form of steam engine was described in a treatise written by Hero, a philosopher of Alexandria, who lived 130 B. C. In a paper submitted at the last meeting of Mechanical Engineers by Professor Thurston, of Sibley College, Ithaca, the statement was made that towards the close of the nineteenth century the nearest approach to a perfect steam engine has been made by reversion to an ancient type and by the reproduction, in refined form and proportions, of the Greek idea of the steam engine. Branca in 1629 proposed a steam turbine which was a modification of Hero's reaction wheel, and his form was adopted by modern hydraulic engineers; but it is only recently that the engine began to be seriously considered by engineers as a practical form of heat motor. Within the last twenty-five years both the Hero and Branca forms of turbine have been extensively introduced into the United States without attracting attention. It has been applied largely for cream separators, making from 6,000 to 8,000 revolutions per minute, and is remarkably efficient and economical for dairy and other forms of machinery. The work of Parsons, who a few years ago built the famous steamer Turbinia, which attained a speed of about 40 miles an hour, brought the possibilities of the turbine into prominence, and it has come to seriously compete with the reciprocating engines where high speed is desirable.

The steam turbine of Parsons is an engine consisting of two series of cylindrical turbines arranged symmetrically right and left of a central steam inlet, the exhaust taking place at the ends. Oil is forced through the bearings by a pump. While driving the torpedo boat this engine developed 2,100 horse-power, about as heavy as two locomotives, with machinery weighing, with water in the boilers, 22 tons.

The Dow turbine is another extraordinary steam motor. It is said to have attained a speed of 35,000 revolutions per minute, and has worked regularly at 25,000 revolutions, using 45 pounds of steam per horse-power. Some of these motors weigh less than 3 pounds per horse-power developed.

The advantages claimed by Mr. Parsons for the steam turbine for marine purposes are increase of speed, of steam economy, of carrying power of vessel, of facilities for navigating shallow waters, of stability of vessel, and of safety to machinery for war purposes. It is also certain to reduce the weight of machinery, initial cost, space occupied by machinery, cost of attendance on machinery and the cost of maintaining the machinery. Besides these the vibrations will be materially reduced, as also the weight of propellers and shafting.

Experience with this motor leads Mr. Parsons to assert that the application of the steam turbine principle to fast ships in general, including passenger vessels, Atlantic liners and ships of war, would appear to present no special difficulties. It may be said, generally speaking, that the larger the scale on which the engines are made, the simpler is the construction, the higher the steam efficiency and the lower the speed of rotation.

In his conclusions Professor Thurston in a general way sustains the claims made by the designers of steam turbines.

ANOTHER ROUTE TO THE COAST.

The Canadian Parliament in session at Ottawa will be petitioned to grant a charter to the Canada National Railway & Transport Co., which seeks to establish a new lake and rail line between Duluth and Chicago and the Atlantic seaboard via Collingwood, Toronto, Lake Ontario and the St. Lawrence river.

Prominent among the Americans whose names appear on the petitions for the charter are George G. Barnum, of the

Barnum Grain Co.; P. S. Anneke, of the A. Fitger & Co.; John Millen, vice president of the Alger, Smith & Co., and George Frank Piper, of Minneapolis, of the American Linseed Oil Co.; Fred Kraus, a prominent miller and malster of Milwaukee; John G. Keith, a prominent vesselman, of Chicago, and George H. Breyman, a Cleveland capitalist. Prominent Canadians also appear on the petition.

The petitioners in behalf of the Canada National and Transport Co. pray for a charter enabling the company to build and operate the railroad and steamship line, telegraph line, construct wharfs, warehouses, etc. A similar petition received the favorable consideration of the house of commons a year ago, but was subsequently defeated.

It is learned that the promoters of the proposed new lake and rail line contemplate that, among other things, it will become an important route for the movement of grain and flour for export.

SHIPMENTS OF LAKE SUPERIOR ORE IN 1900.

The shipments of Lake Superior ore in 1900, so far as statistics can be secured, made up the massive amount of 19,059,393 gross tons. The mines in operation for the year were 106, as against 95 in 1899. As showing the enormous amount of business being done in the tributary group of ranges, the output of the last five years has rolled up a total of 71,000,000 tons. From statistics collected by the Iron Trade Review, the Marquette Range is credited with 3,457,522 tons; the Menominee with 3,261,221 tons; the Gogebic with 2,875,295 tons; the Vermillion with 1,655,820 tons, and the Mesabe Range with 7,809,535 tons. The shipments by ports are given as follows: Escanaba, 3,436,734 tons; Marquette, 2,651,861 tons; Ashland, 2,634,687 tons; Two Harbors, 4,007,194 tons; Gladstone, 418,854; Superior, 1,523,899; Duluth, 3,688,986 tons. Taken all together the iron ore industry of the Lake Superior region made a magnificent showing in 1900, and beat the record.

ABANDONING STOCK PILING

The big mines of Ironwood, Mich., owned by the Oliver Iron Mining Co. have practically done away with the system of stock-piling, which has been in vogue at all the mines of Lake Superior country ever since the first one was opened.

Heretofore the principal work at the mines during the winter months was the hoisting of large quantities of ore to the surface and depositing in huge piles to be loaded upon the cars with steam shovels at the opening of the shipping season. This winter, however, the Oliver company has done practically nothing in the way of stock-piling, but this has confined its work to opening up the mines underground and putting them in such shape as will render possible hoisting of a large quantity of ore the coming summer.

The reason for this change in the system is that the stock-piling of the ore necessitated its handling twice and in many cases ore that had been stock-piled during the winter months was found to be solidly frozen in the spring that it was necessary to use dynamite before it could be loaded on the cars. It is thought that by putting the mines in proper shape large shipments can be made without the expense of stock-piling and rehandling the ore.

Another thing that may have had something to do with the change is that heretofore there were hundreds of thousands of tons of ore on the surface in the stock-piles at the mines every spring. This ore has always been assessed as personal property and has greatly increased the assessed valuation of the mining properties. Under the new tax law the companies are required to make sworn statements which show the actual amount of ore in stock. The stock-piles have heretofore been the principal item in the personal property valuations of the mines, and their passing will greatly lessen the assessment of the mining companies.

MEETING OF THE LAKE CARRIERS' ASSOCIATION.

A meeting of the executive committee of the Lake Carriers' Association was held on Friday, in the office of Capt. James Corrigan, Cleveland. The meeting was called to take up the matters which had been left to the executive committee by the last annual convention of the association.

The new ruling of the collector of customs at Duluth was the first subject to be brought up. The collector intends to hold all vessels until their cargoes can be examined. The meeting decided to request four members of the Association in Chicago to confer with the collector of customs and learn if vessels would be allowed to continue their trip without delay if the agents of the vessels gave the collector full figures on the cargoes, that is, a complete manifest as is universally accepted.

Lake captains have been much annoyed by members of their crews deserting at Duluth. As none of the committee knew how to handle the subject, the matter was referred to the counsel of the Association. Flaxseed shippers wish the bill of lading to be the same as the bills of other grains, but the committee decided not to make a change on account of the great value of flaxseed. The damage per cent. rule of one-half a bushel to every thousand will be retained.

The committee also reported that they were not opposed to the proposed cable transfer across the canal entrance to Duluth, if that city will be responsible for all damages that occurs through the failure of the apparatus to work.

Among those present at the meeting were Capt. Drake and Capt. Brown, and Secretary Keep, of Buffalo, and Capt. Elphicke, of Chicago.

BRIDGE ACROSS BEHRING STRAITS.

"No longer a young man, I believe I yet will live to see a continuous line of railway from New York to St. Petersburg and other European capitals. Such a highway, in the nature of things, is only possible by way of Behring Straits, and work on one of the principal connecting links will be commenced within 12 months. I refer to the building of a railway from Port Valdez, on the sea, to the American Yukon. That great enterprise will undoubtedly be inaugurated within a year," said Captain John J. Healy, the noted Alaskan pioneer, yesterday.

Continuing, Captain Healy said: "This Copper River steel highway is sure to be built. After crossing the mountain range, the railroad will follow the Tanana to its mouth in the Yukon. From this point nothing seems more certain than that it will be projected to Nome, up through that district and across Behring Straits into Siberia. Such a project would, of course, involve an international company and international co-operation, and these results will be forthcoming. It requires no great stretch of engineering imagination to conceive the idea of a railroad across Behring Straits. It is but 20 miles on the American side to Dromede Island, and less than that to the Siberian shores."

ANOTHER CAR-FERRY TALKED OF.

The Escanaba & Lake Superior Railroad Co. and the I. Stephenson Co., the heaviest stockholders in both being Daniel Wells, Jr., of Milwaukee, Isaac Stephenson, Marinette, and J. W. Wells, of Menominee, will inaugurate a car-ferry service in the spring from Wells, Delta county, to Southern Michigan, the point which has not definitely been determined. Mr. Wells says that the plans for this service are yet in such an embryotic state that they cannot be definitely divulged, but suffice it to say the service is assured.

A big steel car-ferry to carry twenty-five or more cars from Wells to one of the big railroad terminals on the east shore of the lake providing a direct route east. The traffic arrangements have not yet been definitely made.



BUFFALO.

Special Correspondence to The Marine Record.

Ice eight inches thick now extends five miles outside of Buffalo harbor and fishermen have resumed operations.

Benjamin Cowles, of Buffalo, is getting estimates on a new wooden tug of about the size of the James H. Clark, recently sold to Capt. Washington, of Tampa, Florida.

The schooner Kingfisher, the property of August Jean, of Buffalo, has been bought by the Lake Shore Sawmill and Lumber Co. for \$6,000. The schooner was built in 1867. Her gross tonnage is 517, and her net tonnage 491. The keel is 165 feet beam is 32 feet. She will be used at the opening of the season for carrying lumber.

The Buffalo Dry Dock Co. has a contract for a small passenger steamer to be completed early this season. The boat will be built for Ossian Bedell and will cost \$25,000. She will be 100 feet over all, 29 feet beam and 9 feet deep. The boat will go into commission within two weeks of the opening of the Pan-American exposition. She will do service on the Niagara river and Lake Erie.

The work of improving Buffalo harbor next season includes the straight channel from the lake at the point where the turn is made to make the mouth of Buffalo creek to the northern end of the Erie basin. There the channel divides, one branch extending north to the Reading coal trestle and the other south to the channel of Buffalo creek. A new harbor line will admit of large increase of slips and water traffic generally.

Masters and engineers of the Union Transit Co.'s steamer line have been reappointed for the season of 1901 as follows: Avon—Norman McGuire, master; Joseph Jamieson, engineer. Portage—John Tierney, master; George Haig, engineer. John M. Nicol—William McLeane, master; George Threthway, engineer. Eber Ward—John McIntosh, master; James Countrymen, engineer. W. H. Stevens—Alex. Clark, master; John McSweeney, engineer. James Fisk—John Pearson, master; Joseph Buford, engineer.

At the Bell Engine Works there is being built for Horace T. Dunbar, of the firm of Dunbar & Sullivan, contractors, a tug that will be of steel throughout, the houses included. The tug is to be 75 feet long, and 17 feet beam, and will draw seven and one-half feet of water. The equipment will consist of a fore-and-aft compound engine with cylinder 12 3/4 and 32 inches in diameter and 24 inches stroke; two water tube boilers of the Roberts type, steam steering gear, steam towing winch and extra tanks for salt water. The tug is intended for service on the Hudson river.

Eleven suits against insurance companies were ordered discontinued by Justice Hooker in the special term of the Supreme Court at Buffalo. The actions were brought by John Kelderhouse, Edward C. Maytham and others as executors of the estate of the late Thomas Maytham, to recover insurance on the steamer Northerner, which burned at L'Anse, Lake Superior, several seasons ago. The defendant insurance companies were the Western Assurance, Fire Association of Philadelphia, Aetna, Standard Marine, Girard Fire and Marine, British and Foreign, St. Paul Fire and Marine, Farmers' Fire, Orient, Providence-Washington and Phoenix Assurance of London. The actions were settled out of court and discontinued by stipulation.

The Buffalo steel plant will begin work on its first canal early in the spring. The plan is to begin just inside the southern terminus of the long breakwater, cut through the low ridge known as Stony Point, and then proceed through the property, a short distance from the lake shore, far enough to accommodate the furnaces, the contracts for four or five being already let and the work under way. The excavation for the canal has begun, so that the company ought to be shipping iron in a small way by midsummer. It is stated that the rail rate of \$2.60 per ton from Pittsburgh to the coast is the best that Carnegie can do. Major Symons, the government engineer at Buffalo, states that with a barge canal in place of the old Erie canal we can ship iron to the coast at 75 cents a ton and at the same time save the rail haul that Pittsburgh must pay on the ore from Lake Erie.

Capt. A. B. Drake, manager of the Inland Lloyds Register, has got all his inspectors at work and the reports are already coming in. In the present condition of the fleet, with so many steel bottoms practically new, the work is comparatively easy, though the time is not very far off when the steel plates will have to be drilled to test their quality and learn how much they have suffered rust. The question of putting on an electrician to prevent the placing of electric lights in positions where they will injure grain cargoes has been allowed to wait further development, although Capt. Drake brought the matter up at the annual meeting of the Lloyds. He finds that practically all the later vessels are so equipped that they will not injure cargoes in this way, but

if there is further cause for complaint something will be done. Former Harbormaster Soper is doing the Buffalo inspection.

Weather Observer Cuthbertson looks for an early opening of navigation on Lake Erie. He says: "We have so far had a very open winter, the average temperature having been considerably in excess of the normal. During the month of January the temperature has been 96 degrees in excess of the average mean temperature of other years. Last year there was a deficiency of 10 degrees from the normal. The backbone of winter is usually broken early in February, so that if the weather has moderated by Feb. 10 we are likely to have an early spring. It is impossible to have as long a winter as we did last year. There was ice in the lake last spring as late as May 16, something quite phenomenal. This year there is less ice in the lake than for years, and as it is the accumulation of ice at this end of the lake that keeps us cold, we are sure to have a tolerably early spring."

The owners of the barge H. W. Sage have two admiralty suits on their hands. The first suit is against the Hall tug Thomas Wilson, which ran the Sage upon a rocky bottom in St. Lawrence river. An effort was made to settle this case and it was thought by the Buffalo attorneys of the schooner that it had been accomplished, but Mr. Goulder at the last moment announced that he was going to contest the suit. So testimony has had to be taken in New Haven, Ct., where a captain who sails on the ocean in winter makes his home. The second suit began against the western liner Chicago for having sunk the barge near Herson's Island, St. Clair river, will come up for trial the 20th of the present month. The defence in this case is that the accident was unavoidable, but the plaintiff will try to show that the tiller cable of the steamer was not sufficiently strong. The suit involves the recovery of \$20,000. Both cases will be tried here.

PORT HURON.

Special Correspondence to The Marine Record.

St. Clair river is blocked with ice to a point opposite the southern city limits.

Vessels wintering at Port Huron have been inspected for Inland Lloyds by Capt. Edward Thorpe, of Buffalo.

Capt. C. C. Balfour, of St. Clair, will sail the steamer C. A. Eddy the coming season. The steamer is in his charge at St. Clair for the winter. Capt. Balfour has been in the service of the Bay City owners of the Eddy for the past fourteen years.

Since the memory of the oldest inhabitant Port Huron has had a saw mill and sometimes several mills. The Howard mill has been shut down permanently and this will be the last season for N. & B. Mills, of Marysville. Only the logs on hand will be sawed. The scarcity of logs is the cause of the mills going out of existence.

The damage suit some time ago commenced by Charles Eshelby against the Wright & Botsford Elevated Co. for injuries to his limbs sustained on a steam traveler used in unloading the company's boats at the Grand Trunk sheds, was settled out of court by the payment of \$250. Judgment for that amount was taken in the circuit court by consent. The amount sued for was \$10,000.

Capt. Samuel Burnham, of the steamer Mary, was at the register of deeds office, one day this week, discussing the sale of a large quantity of sugar beets to Bay City parties, by the Marine City beet sugar factory. It appears that many of the beets had begun to rot and for this reason it was thought better to sell them. Capt. Burnham in referring to the matter said: "The trouble with the Marine City sugar beet factory is that there are too many dead beet lying around."

Capt. Thomas Currie, of this city, a well known lake vessel man, died on Friday morning, at the home of his mother at Algonac, whence he had gone only three days ago on a visit. Before leaving here he had been ailing with the grip, which developed into pneumonia. Deceased had resided in this city for twenty-three years and was fifty years of age. He is survived by a widow and ten children. He was a Mason, a member of the Shipmasters' Association and of the Maccabees.

During the past year the Shipmasters' Association paid out \$14,000 in death claims, and has a balance of \$2,378 in the endowment fund at the present time. The deaths were as follows: Delosa Waite, No. 1; John Van Rensler, No. 8; A. A. Cox, No. 2; Joe Nicholson, No. 7; A. Morrison, No. 4; John W. Jordan, No. 2; William Young, No. 4; Fred W. LaSalle, No. 1; Albert Stewart, No. 7; F. S. McCabe, No. 1; James Lawless, No. 1; John Leonard, No. 4; John Hagan, No. 8; John Hurley, No. 1.

L. Jones, a representative of the Standard Construction Co., of Cleveland, O., has spent the past two days in Port Huron. Mr. Jones' company has made a proposition to construct the canal from Lake Huron to Black river, for \$95,000. He claims that he has an option on the right of way through Huronia Beach, and that no one else can secure it. It is understood that Marcus Young says that the company could not afford to construct the canal for the amount it has agreed to, and that he made reasonable reductions in the price of the right of way. The first step in connection with the canal is to have the sanction of the Secretary of War to direct water from its natural course, this feature most of our citizens seems to forget or ignore, like they so conveniently did at Sault Ste. Marie, until brought up with a round turn. Mr. Jones has no more right of way through Huronia Beach than any other contractor could have.

CHICAGO.

Special Correspondence to The Marine Record.

Chief Engineer Randolph of the sanitary district has arranged with the city authorities to widen the draw of west Washington street bridge by cutting away two feet from each side of the channel and doing needed dredging.

President J. H. Graham of the Graham & Morton Transportation Co. is now on a trip to Buffalo, Toronto, New York, Brooklyn, Philadelphia, and other eastern points with the view of purchasing a steamer to take the place of the burned City of Louisville. He wants a craft that possesses great speed.

The vessel interests of the late Commodore William H. Wolf of Milwaukee will be managed by David Vance & Co. When the commodore has taken ill recently he realized that even if there should be no fatal termination he would never be able again to give the business strict personal attention, and the responsibility of managing the vessels was therefore placed in the hands of the well known firm.

Vessel captains contend that the breakwaters placed outside of the harbor piers at Racine and Kenosha are a menace to navigation and will continue so until they are extended several hundred feet in a northwesterly direction. Capt. Warren, United States Engineer at Milwaukee, declines to recommend extensions until it has been more clearly demonstrated what difficulties exist and what remedies may be applied.

Grain shippers to obtain boats for winter storage of corn, paid an advance of a quarter of a cent on Wednesday. The rate has been 2 1/4 cents, but the chartering has been slow because the corn has been soft. Now the cold weather is hardening some and the rates braced a little. Two and one-half cents was freely offered, but the owners are still a little wary about taking even that rate, fearing the condition of the corn. The receipts of grain are heavier than they have been. Oats are quoted at 1 1/4 cents.

The third of the Counselman or Northwestern Steamship Co.'s lake-and-ocean steamers was launched from the yard of the Chicago Ship Building Co., at South Chicago, Saturday, and named Northwestern. Her length is 256 feet, beam 42 feet, and molded depth 26 1/2 feet. Two sister vessels, the Northman and Northtown, have already been launched, and one remains to be finished to complete the contract. The four are designed to ply between Chicago and Liverpool, carrying out American products and returning with European merchandise. The average speed of the steamers is designed to be about fifteen knots per hour.

Capt. Patrick J. Mahoney, a pioneer navigator of Lake Michigan and a resident of Milwaukee sixty years ago, died at the residence of an only son in Chicago last week and was buried at Waukegan. Deceased had attained the age of eighty years and was a native of Cork, Ireland. He came to Milwaukee in 1837 on the schooner Galloping Tiger. Between that date and 1885 he commanded successively a number of vessels engaged in the Lake Michigan trade. He owned and sailed the schooner Selma, which was dismantled off Manistee in 1885. From Milwaukee Capt. Mahoney removed to Waukegan, where he resided until the death of his wife twenty years ago. After that he found a home with his son in Chicago.

In addition to hull reconstruction, the steamer F. & P. M. No. 5 is being thoroughly rebuilt from the main deck up at Milwaukee. All of the houses on the spar deck have also been removed with the intention of putting on a full length passenger cabin. The main deck aft and a number of deck-beams have also been renewed. The cost of this repair work and the construction and furnishing of a modern passenger cabin, with necessary plumbing will be in the neighborhood of \$45,000 or \$50,000. It will be necessary also in order to fit the steamer for the Holland route to move her boilers forward in order to lessen the draught of water aft. The stateroom accommodations of the steamer will provide for about 175 passengers.

A project that has been under consideration during the past three or four seasons, the purchase of the Miller Bros. drydocks, bids fair now to be carried to a successful conclusion. C. A. McDonald, John G. Keith and Robert W. Dunham have, it is said, secured an option on the property and are at present making an effort to interest eastern capital with a view to closing the deal. Should the purchase be made the facilities of the plant will undoubtedly be increased so as to meet the requirements of the times as nearly as possible. The Millers have three stationary drydocks, all of them small. One of these, however, at the extreme lower end of Goose Island, is so situated as to be easy of access for vessels of large size, and can be widened, lengthened and deepened sufficiently to accommodate them. Only repair work can be done at the plant, but of this there usually is an abundance the year round and the property, run down as it is, and has been, still makes a handsome profit on each season's work.

The Thomas freight and passenger steamboat line, owner of the steamers Pilgrim and Douglas, has purchased the City of Holland to take the place of the Douglas, which has now been in commission five years. The new boat will be put on the Detroit and Rogers City route as soon as navigation opens. The City of Holland, the purchase of which was completed last night by Charles W. Thompson, general manager of the line, is practically a new boat, having been built in 1893, at Saugatuck, for the Holland & Chicago Transportation Co., and used in connection with the Pere Marquette railroad, running between Marquette and Chicago.

She is 155 feet in length, 29 feet beam, and elegantly fitted up for passengers. She is capable of a speed of 13 miles per hour, and fitted throughout with electric lights. The stack is placed amidships and the craft is of handsome lines. She is now in winter quarters at Holland, Mich., and will arrive at Detroit as soon as the weather permits. The Douglas will be discontinued on the route, and she will be sold if enough is offered for her. The City of Holland has just double the capacity of the Douglas, and more attention will be given to the passenger trade by the line the coming season. Capt. F. J. Meno, of the Douglas, will be in command of the new boat; H. W. Knapp will be purser, and Joseph Meno engineer.

DULUTH-SUPERIOR.

Special Correspondence to The Marine Record.

The Michigan Lake Superior Power Co. announces that the remedial works in the rapids of St. Mary's river will be commenced in the spring as soon as the ice is out. It is estimated that it will cost \$300,000. The remedial works are to maintain the upper lake levels.

The receipts of grain are heavier than last year, being confined largely to oats and corn. Some sales of wheat have been made for spring delivery, but no chartering is expected for the present because there are 3,000,000 bushels now at the eastern terminals which are unsold.

Fire is raging in one of the soft coal piles at the Youghioheny & Lehigh docks at the West End. The fire is on the other side of the dock from where the former large fire was, but it is not expected to do much damage. A force of men are getting coal out of the way, however, and sending streams into the bottom of the pile where the dock is burned through.

Lumbermen have picked up a few small vessels and are in the market for some tonnage, but they cannot agree with the owners on freight rates. Large sales of lumber are being made at most of the upper lake ports and the indications are that the movement will be heavy during the coming season. The owners are firm and will not charter unless they get a fair price. The Edward Hines Lumber Co. Chicago, are large factors in the trade at the head of the lakes. They disposed of six million feet a few days ago and other deals are pending. The Empire Lumber Co. Toledo, purchased enough to make several cargoes and two million feet was sold to parties in Superior.

No one up here wants to see the handsome twin screw steel passenger steamers put into the Lake Michigan trade, but, if they are it will be according to the best judgment of their managers, and there are no keener men engaged in the lake trade. I was asked this week for a reason for the Detroit-owned passenger lines rushing into print so much regarding two boats which it is said they will put on the Detroit-Buffalo route direct. They have widely announced that any competition will be fought and killed, then they holler so much more. There are wheels within wheels, and I suppose the Detroit people know what they are after all right, also that the keels for two more boats will be laid in due course.

The break in the great Peavey concrete elevator at Duluth, which occurred several weeks ago, has been boarded up and will be permanently repaired in the spring. Several thousand bushels of wheat ran out upon the ice but was recovered with little loss. The walls of two of the outside bins were shoved right out by the pressure of the wheat as if they were made of eggshell. The accident was probably caused by filling the inside bin with 56,000 bushels of wheat and not filling these two bins. This made an immense pressure, all one way, and the result was that the walls of the middle bin gave way. The walls of the bins were bound with iron bands $\frac{3}{8}$ of an inch thick and $\frac{3}{4}$ of an inch wide. These bands ran entirely through the walls and were about ten inches apart. They were broken into hundreds of pieces and bent and twisted into all shapes. At the present time big chunks of concrete are hanging from the edges of the wall, the iron bands holding them. The remaining bins are now being filled with wheat but all at once instead of one at a time. There are fifteen of these bins and it has been intended to build fifteen more next year, but it is not likely that they will be built as soon as planned, at least not until the present bins have been thoroughly tested. This is the first and only concrete elevator in the western hemisphere and is many times larger than any other similar elevator in the world. There are smaller concrete elevators on the lower Danube, but none of them are built as strongly as this one. There is quite a spirit of disappointment evinced at the first apparent failure or weakness in the concrete system of grain elevators, as it was fully understood that all pressures and contingencies had been fully taken into consideration, and hitherto unknown factors provided against at all points.

The keel has been laid and work is now in progress at the Collingwood, Ont., shipyard, on what will be one of the finest passenger and freight steamers on the Great Lakes. The vessel is being built for the Sarnia and Duluth route, and in size and appointments will be a larger and finer vessel than the Manitoba, which is considered to be one of the finest steamers in the inland marine. The length of the new steamer will be 325 feet, beam 43 feet, molded depth 27 feet. The keel and all portions of the vessel will be built of steel. Four boilers and triple compound engines will develop 2,500 horse-power and guarantee fifteen miles an hour loaded, and seventeen to eighteen miles light. This is the first keel laid in the new shipyard, and it is expected the vessel will be completed by the first of next September.

DETROIT.

Special Correspondence to The Marine Record.

In the case of the St. Clair Steamship Co. against the steamer Appomattox, barge Santiago and steamer Inter Ocean, Walter Oades and Byron W. Parker have been appointed by Judge Swan to appraise the value of the barge Santiago and the cargo of coal at the time of the collision.

The D. & C. has signed a lease with the Jones' estate for that portion of the wharf between the present D. & C. wharf and the Star Line dock. This gives the D. & C. 1,000 feet of river front. The contemplated new Detroit and Buffalo line boats will have the Shelby street side of the wharf. This lease will not be operative for one year.

Capt. Alex J. McKay was Tuesday presented with a fine diamond ring by his associates in the Detroit lodge of the Shipmasters Association for his services in assisting to secure the amendment of the obnoxious ruling compelling all license holders to be re-examined on renewal of their papers every five years. The presentation speech was made by Capt. L. M. Stoddard.

At the annual meeting of the Michigan Fire & Marine Insurance Company, D. M. Ferry was chosen to the presidency, in succession to the late David Whitney. Frank H. Whitney, who has been secretary of the company since July, 1892, was elected vice president, in which office he will continue the general business management. The secretaryship was filled by the selection of E. J. Booth, who has been with the company since its organization, 20 years ago, and for several years assistant secretary.

Capt. Francis Martin, who was born June 4, 1800, and who is believed to have been the oldest officer on Uncle Sam's pay roll, died at his home here last Thursday. He was born in New York, and at fourteen years of age was at sea. He was appointed a third lieutenant in the United States revenue marine by President Jackson in 1832, and continued in active service on the ocean and the lakes until twenty-five years ago, when he was placed on waiting orders. He was retired on half pay in 1895. He leaves a widow (his second wife), two daughters, and a son.

Witnesses sworn in the case of the St. Clair Steamship Co. vs. the steamer Appomattox and schooner Santiago and the steamer Inter Ocean for causing the wreck of the Fontana last summer, off Ft. Gratiot, before Judge Swan, the plaintiffs introduced evidence to show that the Santiago, which struck the Fontana, is a hard steering boat with insufficient steering apparatus. Messrs. Canfield and Gray, the attorneys for the Inter Ocean, assisted in strengthening this point, as the Inter Ocean is dragged into the case through a charge that it was her attempt to pass the Santiago which caused the whole trouble.

The suit of the Williams Transportation Co. against the Darius Cole's owners, of Detroit, is being tried at Cassopolis, Mich. In September, 1899, the Williams company purchased the Darius Cole for \$125,000, intending to run the steamer on Lake Michigan between South Haven and Chicago. The steamer was guaranteed to have a speed of fifteen miles an hour, so the plaintiffs allege. The purchasers, upon signing the contract, paid \$10,000 and \$65,000 when she was delivered. The company gave notes for the remaining \$50,000. The Williams company is suing on the guarantee, and has tendered the steamer to the defendants, asking the return of their money.

That the new steamboat line between Detroit and Buffalo is a popular idea with investors in steamboat property is proved by the fact that since the announcement of the formation of the company there has been a rush of applications for both stock and bonds. Requests have been received from a number of eastern capitalists. A member of the company says that stock and bonds are already oversubscribed. It has been decided that the stock to be sold at par shall amount to \$650,000; the bonds to be issued for a like amount. In case of increasing financial demands new stock can be issued. The plan gives preference to the stockholders of the D. & C. and C. & B. companies in the distribution of the stock and bonds, it being practically decided to hold the control of the line between these two companies so far as is possible. The designer's work on the boats is progressing. Consulting Engineer Frank E. Kirby, who has been ill for some time, has recovered sufficiently to assume personal charge of the work. It is proposed to order the material for the boats as soon as possible and to push the detail preparations during the next few weeks in order that both boats can be in service within fourteen months.

CLEVELAND.

Special Correspondence to The Marine Record.

Mr. Quincy Miller, for a number of years master boiler maker for the Cleveland Ship Building Co., and later in business for himself, intends to go sailing again this season.

The Chase Machine Co. are kept working on full time with as large a force of skilled men as can be placed to advantage. A number of medium sized steam towing machines, for which there appears quite a demand, is among the new work.

The local yards and dry docks of the American Ship Building Co. are as busy as they can possibly be, and the same is also reported from the extensive plant at Lorain, a town, by the way, which is fast being regarded as a suburb of Cleveland. The American Ship Building Co. furnishes the complete ship, including hulls, engines, boilers and all equipments.

At a meeting of Licensed Tugmen's Protective Association, No. 5, held last Friday night, a beautiful silk pennant was presented to genial Capt. Joseph Todd, captain of the steam yacht Say When, as a token of the esteem in which he is held by the members of No. 5.

Carferry service on Lake Erie has been suspended through the withdrawal of the transfer Shenango for needed repairs. Owing to the bad condition of the harbor at Port Dover the carferry has been running to Port Stanley only. It is said that consumers of soft coal have been getting low rates through Canada via this route and that in the course of time a very important trade could be worked up over this route.

The annual meeting of the stockholders of the Cleveland & Buffalo Transit Co. was held at Rockport yesterday. Messrs. M. A. Bradley, George W. Gardner, Daniel Schurmer, Harvey D. Goulder, George W. Avery, R. C. Moody and T. F. Newman were all re-elected directors. The directors will meet in a few days and re-elect the officers. They are M. A. Bradley, president; Geo. W. Gardner, vice-president; Geo. W. Avery, treasurer, and T. F. Newman, secretary and general manager.

Members of the Shipmasters' Association and the American Association of Masters and Pilotes are making an effort to have the dangerous shoals at the upper end of Lake Erie marked better than they were last season. Last April the Dummy lighthouse was destroyed by fire. A gas buoy was put out to mark the shoal but it was fouled by a steamer and never marked satisfactorily. Afterwards captains report that it was not lighted more than half the time. A number of vessels grounded in that vicinity and the wonder is that the groundings were not still more numerous.

All the local managers of the Great Lakes Towing Co. between Duluth and Buffalo are in the city. A preliminary meeting has been held at the office of the company in the Western Reserve building. General Manager Collier and Secretary Wardwell met the managers, but no business of importance was transacted. The tugmen will be here for several days and plans for handling the business for the coming season will be arranged. General Manager Collier yesterday appointed Capt. Alex. Walters local manager at Buffalo. Capt. Walters was in the tug Dunbar last season.

Mr. J. C. Gilchrist closed another deal this week. He bought the wooden steamer D. C. Whitney from the Whitney estate. The price was not given out. The Whitney was built in 1882 at St. Clair, for the late D. M. Whitney, of Detroit. She is 229 feet keel and 40 feet beam. This makes thirteen boats that Mr. Gilchrist has purchased since the close of navigation, and with the eight steel steamers he is having built gives him forty-three boats, thirty-nine steamers and four consorts. Quite a number would like to know who is working this bulk of wooden steam tonnage through Mr. Gilchrist.

At the recent annual meeting of the grand lodge of the M. E. B. A., held in this city, the H. W. Johns Mfg. Co., of New York, had an interesting exhibit in parlor "G," which was in charge of their Mr. L. H. Taylor. They made a special display of their standard Kearsarge asbestos-metallic sheet packings and Kearsarge gaskets, which have a wide and most favorable reputation among engineers, consumers and dealers. These packings are made from asbestos yarn and fine brass wire firmly interwoven into cloth and coated with their special rubber composition, making them especially adapted for high pressure work. Kearsarge possesses great strength, elasticity and heat-resisting properties, and adapts itself to all uneven surfaces, making a superior flat packing for steam and air tight joints, and it is claimed will last twice as long as sheet rubber.

SIZE OF LAKE STEAMERS.

The New York Journal of Commerce makes the statement that the fashion in lake shipbuilding is now moving in the direction of smaller steamers, say four or five thousand tons instead of six or seven thousand, while the reverse tendency is apparent in the building of steamers for deep sea service. Considering the reasons for these opposite tendencies, the paper named says: "The scant amount of water in some of the ports and the connecting channels may have something to do with this, but probably the more important consideration is the ratio of the time in port to the length of voyage. On the lakes the voyages are from two days to a week; on the ocean they are from a week upwards. The time required for loading and unloading is probably greater proportionately with the larger and deeper steamers than with the smaller ones. Where the voyages are rather long the importance of the time spent in port is diminished relatively. However this may be, the tendency to reduce the size of lake carriers while the ocean carriers continue to increase in dimensions has some bearing on the economy of using the same vessel on the lakes and the ocean."

CANADIAN DRY DOCK IN DETROIT RIVER.

The Sandwich council will be asked to take some action for providing a drydock at Sandwich, regarded as the most available place for the erection of a drydock along the Canadian side of the Detroit river. A fleet of 10 European vessels is expected to ply the Great Lakes this coming season, and some of the Windsor business men believe that complete repair accommodations should be provided for them. A number of them express themselves as willing to go into the project.

ANOTHER PLAN OF TAPPING THE LAKES.

A short time ago a citizen of Buffalo suggested that all the minor towns within reasonable distance of Lake Erie, should introduce a central water works system and derive an unlimited supply of good water from Lake Erie. Now comes along the Lorain Daily Democrat with the following editorial suggestions.

"All over the state the cities are having trouble in getting a supply of good, pure water. Right in this vicinity we find North Amherst, Elyria and Oberlin now wrestling with the problem. Down at Canton there has been no end of trouble to get water, and the secretary of the public works there this week said:

'There is only one final solution to the water question in this section of the state. That is to pipe the supply direct from Lake Erie, taking in the towns of Akron, Youngstown, Massillon and others along the route. This seems a rather gigantic undertaking, but I predict that it will be done within the next twenty-five or thirty years. We may provide for a supply of water temporarily, but bringing it from the lake will be the ultimate solution of the problem.'

Certainly this would be a gigantic undertaking but a perfectly feasible one, and one that would be economical as well, after it was installed. The tendency is rapidly now toward municipal, state and national ownership of public works, and what a great undertaking it would be for the State of Ohio to take up the work of supplying the state with water. An immense filter plant could be put up on the lake, located about at Lorain as a central point. Then lay half a dozen big pipe lines in different directions over the state. From these central pipe line branches could be constructed to all the little towns on both sides, and thus the entire population of the state be supplied with clear, pure water.

After once established, the cost of maintaining the system would not be near so heavy as the cost of the present unorganized methods which are very unsatisfactory.

The twentieth century is going to be a century of big things, a century in which government will be used to serve the people, instead of an institution by which politicians rob them, and such a water system is not at all improbable."

Of course there is no such a thing as waste in the universal economy, nature abhors a vacuum, and therefore the demands of these immense supply pipe lines would no doubt be returned to the lake in some form or another, just how we are not prepared to state, although we have thought the matter over for a long time.

If every state bordering on the lakes was to instal its own water works and derive its supply from the lake, would it, or would it not, tend to lower the levels by the amounts annually abstracted therefrom? This is a question which can by no means be answered off hand, but at the same time it is well worthy of the closest attention so that positive statements may be issued, proved and clearly verified in the near future.

VALUE OF THE STEAM TOWING MACHINE.

Among the meritorious devices in aid of shipping that we have called attention to in the columns of the American Shipbuilder, there is none that we have taken greater pride in than the Shaw & Spiegle Steam Towing Machine, manufactured by the American Ship Windlass Co., Providence, R. I., knowing as we do of its recognized value in all cases where towing is concerned. When a device that has, for the past twelve years, satisfactorily proved itself by practical tests to be all that is claimed for it, and is the means by which lives and floating property may be saved, and at the same time economical in its workings, we claim that it should be the desire of all enterprising newspapers to enlighten its readers to the fact that there is in existence something that is to their interest. It is news—and invaluable news. Scarcely a week passes but what announcements are made in the papers of steamers, which are taken in tow in a disabled condition, being left to their fate on account of hawsers parting and towing being impossible. These casualties could all be avoided by the use of the steam towing machine, and it would be a very handsomely remunerative investment for steamers and tugs. Take for instance the recent fate of the Liverpool sailing ship Primrose Hill, which was wrecked and of her crew but a solitary survivor remained. Had the powerful tug, Wm. Joliffe, which had her in tow, been provided with a towing machine, the ship and men would have undoubtedly been saved. Many vessels on the Great Lakes have been furnished with this machine and a large number is used on the coast and ocean, and it won't be long ere it will become universal.—American Shipbuilder, New York.

A PLEASANT ANNUAL MEETING.

The annual meeting of the White Star Line Co. at Detroit this week was the most satisfactory in the history of the various Star Line companies which have been organized into the White Star. The annual reports of Secretary Bielman and Manager Parker showed the past year to have been far in advance of the expectations of the company.

The addition of the big passenger boat Tashmoo to the line, which brought with it additional responsibilities for the management, showed that good boats pay, and Manager Parker, who has for a long time discussed the possibility of having still another new boat, was given authority to act at once in securing a definite plan for the building of a steamer for service in 1902. Mr. Parker stated that Engineer Kirby, who had designed the Tashmoo, had been furnished with the rough drafts and ideas which Mr. Parker desires to have incorporated in the new boat, and that the first drafts of the plans would be ready for inspection in a week or so.

The former officers were re-elected as follows: President, A. A. Parker; vice-president, L. C. Waldo; treasurer, John Pridgeon, Jr.; general manager, B. W. Parker; traffic manager, C. F. Bielman.

MONTHLY SHIPBUILDING RETURNS

TREASURY DEPARTMENT,
OFFICE OF THE COMMISSIONER OF NAVIGATION,
WASHINGTON, D. C., January 31, 1901.

The Bureau of Navigation reports 51 vessels of 11,434 gross tons were built in the United States and officially numbered during the month of January, 1901, as follows:

	WOOD.				STEEL.		TOTAL.	
	SAIL.		STEAM.		STEAM.			
	No.	Gross.	No.	Gross.	No.	Gross.	No.	Gross.
Atlantic and Gulf..	24	5,293	10	473	1	175	35	5,941
Pacific.....	1	86	2	55	.....	.....	3	141
Great Lakes.....	.....	.....	2	125	1	4,153	3	4,278
Western Rivers...	3	71	7	1,003	.....	.....	10	1,074
Total.....	28	5,450	21	1,656	2	4,328	51	11,434

The largest steel steam vessel included in these figures is: Wilkesbarre, 4,153 tons, built at Buffalo, owned by Erie R. Co.

The foregoing figures do not include craft without motive power of their own. From other sources than construction two vessels of 2,671 gross tons were added to the merchant fleet, the principal ones being:

Rig.	Name.	Gross Tons.	Why Officially Numbered
S. S.	Edith	2,369	Foreign wreck
S. S.	Scythian	302	" "

ELECTION OF OFFICERS.

Detroit Steamboat Companies at their annual meetings held this week elected the following officers:

Ionia Transportation Co.—F. M. Thompson, president and treasurer; E. L. Thompson, vice president; W. W. Kelly secretary.

Thompson Transportation Co.—E. L. Thompson, president; C. A. Chamberlin, vice president; F. M. Thompson, treasurer; R. H. Phillips, secretary.

The following directors of the Detroit & Cleveland Steam Navigation Co., were re-elected: James McMillan, William C. McMillan, Hugh McMillan, James H. McMillan, David Carter, George Hendrie. The election of officers was postponed on account of the absence from the city of some of the officers.

ANOTHER STEEL STEAMER.

Work upon a sister steamer to the Canada-Atlantic liner Ottawa, which was launched on May 23 last, has been commenced at the Bertram plant in Toronto. The new vessel will probably be ready for launching about May 24. Like the Ottawa, she will be entirely built of steel, even to her cabins. The principal dimensions are as follows: Length over all, 257 feet; beam, 43 feet; depth, 25 feet 6 inches. She will carry 70,000 bushels of grain on a canal draught of 14 feet. On the upper lakes, where she can load deeper, she will carry 105,000 bushels. The new steamer is being built for J. R. Booth, of Ottawa.

CANADIAN TONNAGE.

The number of vessels built in Canada during 1899 was 277, measuring 21,098 tons register tonnage. Estimating the value of these at \$45 per ton it gives a total value of \$949,419 for new vessels.

PROTEST AGAINST ACTION OF THE LIGHT-HOUSE SERVICE.

DULUTH, MINN., Feb. 4, 1901.

Editor Marine Record:

Enclosed find newspaper clipping, may I ask that you give the same publicity in your valuable paper, to show the general public how high-handed we are treated by the Light-House Service?

"Although navigation has not closed at Duluth nor at any of the north shore points between here and Grand Marais, Minn., there is but one light-house to serve the mariner, and this has been the case for six or seven weeks. The light that still holds out to burn is at Grand Marais, the one which is watched over by J. E. Mayhew. The steamer Bon Ami is still navigating the north shore, and Capt. Singer, manager of the White Line Transportation Co., wonders what is the matter with the light-house keepers of Duluth and Two Harbors. The light at Two Harbors has not been burning for more than a month, and at Duluth the light never burns except once in a while one will be taken out to the end of the piers when the boat is arriving. Capt. Singer says that he understands the lights are supposed to be kept burning, as long as boats continue to run.

'The commander of this light-house district,' said Capt. Singer, 'tells me that the light houses are supposed to be operated as long as the boats keep going. I am running my boat, the Bon Ami, without insurance, largely for the accommodation of the people who have interests on the north shore. I do not intend to lay the boat up until the ice forces me to, though I would cheerfully do so as far as the profits of the winter business are concerned, taking in connection with the chances of loss without recourse. Things have changed here on Lake Superior. A few years ago it was something extraordinary for a boat to make a trip in January. Yet for the past three years we have been running boats very late, and this winter later than ever before. A boat needs a light-house service now as badly as any time of the year. It is especially dangerous making the ship canal of a cold night when the steam is rising from the water. The shore and piers are obscured, but if a light were burning above the piers it would be easy to pick one's way into the harbor. I don't understand the refusal to furnish light-house service, but it will have to be provided. We don't want to have to depend upon a man sighting the boat and then running out and lighting the lamps.'

The Bon Ami, having on board 50 passengers and a full load of merchandise, stranded on January 19th, on Minnesota Point, owing to the maliciousness of the light-keepers, who have discontinued the lights at Duluth as well as at Two Harbors.

Yours truly,

A. CLAUSEN,
Master Stmr. Bon Ami.

ASBESTOS FIRE-PROOF BULKHEAD LININGS.

A non-conducting, incombustible, splinter-proof covering for use in living spaces on the inside surface of the outer shell of steel vessels, and especially for magazines, coal-bunkers, and boiler-room bulkheads, has been developed by the H. W. Johns Mfg. Co., New York. The wooden sheathing or paneling at first used in such places was replaced because of its combustible qualities by a light steel sheathing, which has been a source of constant complaint of discomfort and danger to health. Because of the numerous complaints, the asbestos sheathing was developed to meet the objections to both steel and wood sheathing. This it fully does. The finished sheathing possesses the primary requirements of a non-conducting, incombustible, splinter-proof covering; it is light in weight; in appearance it is clean, neat and ornamental, and it also adds to the comfort and habitability of living spaces, being warm in winter and cool in summer. The total weight of the completed sheathing, including framework and fastenings, averages six and one-half pounds per square foot. Data taken during the mild heat of September show that the effect of the sheathing on the side of the ship exposed to the direct rays of the sun was to reduce the temperature from twenty to thirty-five degrees Fahrenheit.

Particularly good results have obtained in the U. S. Navy by using this asbestos lining or sheathing, and it has been fitted around the engine room trunk in junior officers' quarters on the U. S. New York; in the wardroom of the U. S. Indiana, where it was fitted in portable sections; in the wardroom and certain staterooms on the U. S. Massachusetts; and in officers' quarters on the Atlantic and Cincinnati, where the method of fitting is as above described. In the Atlanta's cabin, the outboard side and the under side of the turtleback deck over the cabin have been sheathed.

SUBSTITUTES FOR SHIPS SUBSIDIES.

In the January number of the North American Review Mr. Louis Windmuller contended that the ship subsidy bill now before Congress would fail, if it were passed, to accomplish its avowed objects. In the February number of the Review Mr. A. R. Smith, formerly secretary of the American Mercantile Association, replies to Mr. Windmuller. Mr. Smith appeals to the past experience of the country to demonstrate that the bestowal of a subsidy has always been followed by an increase in American tonnage, and he finds much significance in the fact that all the testimony presented to the Congressional committee which favorably reported the bill gave promise that its enactment into law would bring about a revival of American shipbuilding. Mr. Smith cites the history of the Collins Line as pertinent to the argument:

"Even going back to 1850, and citing the case of the Collins Line, which in that year had come into full operation, we find additionally interesting data. Our first subsidy act was passed in 1845, advantage of which was taken for the first time in 1847, when but 5,631 tons of steam shipping was under American register. The next year it increased to 16,068 tons, and in 1849, the year in which the Collins ships first appeared, our steam shipping under register had increased to 20,870, more than doubling in 1850, when our steam tonnage under register amounted to 44,842—a growth of over 800 per cent. in three years. It still further increased until 1855, when it reached 116,045 tons, but again declined, probably largely because of the severe losses suffered by disaster to the Collins Line, falling in 1858, to 78,027 tons. This was the year in which the Collins Line failed, and this was the year in which the United States subsidy was withdrawn from the line—at a time, by the way, when its rival, the British Cunard Line, was receiving a subsidy from the British Government of approximately \$1,000,000 a year!"

FIGURES ON IRON ORE.

H. L. Holden, dock agent of the Duluth & Iron Range railroad at Two Harbors, Minn., has prepared some interesting table dealing with all manner of details regarding the 4,007,294 gross tons of iron ore transferred from railway cars to vessels during the past season at Two Harbors. The total number of cargoes was 960 and the number of vessels 181.

One table shows the number of cargoes taken by each of the 181 vessels, the tons loaded each trip, destination of the vessel and the total number of tons carried by each vessel during the season, as well as the average load, draft of the vessel each trip, and the average drafts.

The steamer William Edenborn, one of the Wolvine 500 footers, loaded the largest cargo of the season—7,446 gross or 8,340 net tons. The average cargo for all the vessels was 4,178 gross tons. The average time for loading for all the 960 cargoes was 7 hours. The average draft of ships was 16 feet, 11 inches, and the maximum draft 18 feet ½ inch. One vessel making a trip in midsummer, loaded to 18 feet, 2 inches, but was said to have met with difficulty at the Sault canal.

The steel steamer Mataafa and barge Madiera of the Minnesota Steamship Co.'s fleet distinguished themselves in the Two Harbors trade last season. They each moved nineteen cargoes of ore. The steamer's total of ore moved was 120,904 tons, together they transported 254,361 tons.

NEW TYPE OF ANCHOR.

The following item has gone the rounds of the technical press:

"Marine men are much interested in a new type of anchor which is an application of the water jet to the mushroom anchor. The device consists of a cast disk of from 10 ins. to 2 ft. in diameter (the latter being sufficient for ships of the largest size) being attached to the anchor chain. The disk has a piece of pipe passing through to its lower face. When it is desired to anchor a hose is attached to this pipe and a stream of water is sent through the pipe while the disk is being lowered. The stream of water cuts out the bottom from beneath and allows the disk to sink several feet beneath the surface of the bottom; when the hose is disconnected and withdrawn. The earth immediately settles in over the disk and gives it a holding power greatly in excess of the usual fluke anchor. When it is desired to withdraw the disk the end of the hose is supplied with a ring which slides down over the anchor chain and washes the earth away down to the disk by a series of jets, thus rendering the disk easy of withdrawal."

This device, it will be noticed, pre-supposes a soft bottom at all anchorages, but of what use, pray, would the jet

of water be on a gravelly, coral or rock bottom. The foregoing is an old idea furbished up and baited for the unwary spectator, and was never worth the dignity of a trial of one of the government departments. For prominent moorings in a land-locked harbor, having a soft bottom, such as sand or mud, etc., yachtsmen used to be pleased, (and are still for that matter) to procure railroad car wheels, to take the place of the more expensive mushroom anchors. After becoming well imbedded in the soft bottom it is found that they make safe, reliable, and the best sort of holding ground tackle for the buoy mooring of small tonnage. It is likely to be many a long day before the ordinary merchant vessel will use a spray to squirt a hole in the ocean wherein to deposit her anchor and to get it again by similar means.

SCHEDULE OF TIME TO BE RUN IN CERTAIN PARTS OF ST. MARY'S RIVER.

For the facilitation of speed calculations in connection with the rules and regulations governing the movements and anchorage of vessels in St. Mary's river, the Department publishes the following schedule of distances between certain points along the St. Marys River, together with the time required to run those distances at a speed of nine miles an hour:

Section.	Distance in sta. miles.	Time in min.
Mud Lake Buoy to Everens Point.....	2 5/8	17 1/2
Everens Point to Encampment Crib Light....	3/4	5
Encampment Crib Light to Dark Hole Turn..	1 5/8	11
Dark Hole Turn to Harwood Point Turn.....	3 3/4	21 3/4
Harwood Point Turn to Junction Buoy, Hay Lake.....	3 3/4	21 3/4
Junction Buoy to upper lights, Lower Cut....	2 3/4	18 3/4
Lower Cut to Frechette Cut, full speed.....	.....	.....
Lower Range, Frechette Cut, to Red Can Buoy	1 1/2	10
Red Can Buoy to Lower Light, Little Rapids.	1 1/2	10
Lower Light to North Entrance Light House.	1 1/2	10
North Entrance Light House to Government Pier.....	1 5/8	11
West end of Pier to Big Point.....	2 1/4	15
Big Point to Pointe aux Pins Light House....	3 3/4	21 3/4
Through Dike.....	1 5/8	7 1/2
Through Island Cut.....	1 5/8	7 1/2
Least towing time allowed vessel bound up through Dyke and Island Cut.....	.....	22 1/2

Capt. A. B. Davis, R. C. S., commanding U. S. steamer Morrill, will, until otherwise ordered, have supervision of the enforcement of the foregoing rules and regulations, and all complaints or appeals arising under them will be made to that officer by parties concerned.

VISIBLE SUPPLY OF GRAIN.

As compiled for THE MARINE RECORD, by George F. Stone, Secretary Chicago Board of Trade.

CITIES WHERE STORED.	WHEAT. Bushels.	CORN. Bushels.	OATS. Bushels.	RYE. Bushels.	BARLEY. Bushels.
Buffalo.....	2,814,000	13,000	45,000	55,000	929,000
" afloat.....	1,014,000	.....	162,000	.....	.....
Chicago.....	11,431,000	3,580,000	3,067,000	606,000	278,000
" afloat.....	57,000	175,000	948,000	.....	.....
Detroit.....	461,000	477,000	2,000	31,000	28,000
Duluth.....	7,089,000	2,155,000	925,000	289,000	75,000
Fort William, Ont.....	1,402,000	.....	.....	.....	.....
Milwaukee.....	1,047,000	588,000	827,000	1,000	25,000
Montreal.....	94,000	16,000	92,000	9,000	42,000
Port Arthur, Ont.....	250,000	.....	.....	.....	.....
Toledo.....	563,000	1,516,000	234,000	9,000	.....
Toronto.....	52,000	.....	1,000	.....	3,000
On Miss. River.....	50,000	.....	.....	.....	.....
Grand Total.....	59,767,000	14,825,000	9,929,000	1,135,000	1,873,000
Corresponding Date, 1899.....	54,363,000	14,583,000	5,776,000	1,134,000	1,690,000
Increase.....	.....	688,000	.....	.....	.....
Decrease.....	1,024,000	.....	225,000	19,000	66,000

While the stock of grain at lake ports only is here given the total shows the figures for the entire country except the Pacific Slope.

SHIPMASTERS ELECT OFFICERS.

The grand lodge of the Shipmasters' Association elected its roster of officers as follows: Grand president, C. H. Hubbard, of Chicago; grand first vice-president, George A. Pierce, of Port Huron; grand secretary, Edward G. Ashley, of Toledo, re-elected; grand treasurer, W. A. Collier, of Cleveland, re-elected. The following were selected to fill the appointive offices: Grand second vice-president, J. A. Ward, of Marine City; chaplain, J. L. Holmes, of Cleveland; marshal, E. C. Maytham, of Buffalo; warden, T. C. Herrick; sentinel, Capt. Roch, of Detroit.

MARINE PATENTS ISSUED.

Patents issued January 29, 1901. Reported especially for the MARINE RECORD. We furnish complete copies of patents at the rate of 10 cents each.

666,909. Ship's Davit. E. S. Renwick, Millburn, N. J.
667,158. Centerboard for Vessels. D. S. Webster, Chicago, Ill.

HERE IS PERPETUAL MOTION AGAIN.

Charles Edward Griffing, a mechanical expert, of Hamilton, O., has invented an electrical process for developing steam in boilers, which every mechanical man who has seen it expects to revolutionize the motive power of the world, by practically doing away with fuel, says a dispatch from that city: By the Griffing device, water is projected in the form of a dense spray on electrically heated flues, thus generating steam instantly. The electricity is provided by a dynamo, which is in turn to be operated by the excess steam of the boiler. The only power required outside this compensating process is the initial force needed to start the dynamo and run it long enough to get up steam. This will be furnished by a small gasoline engine and a pint of fuel.

If Mr. Griffing's plan proves to be all that is claimed for it, it will be possible to run a man of war around the world or a railroad train from Boston to Los Angeles with no other fuel than a can of gasoline.

Mr. Griffing has organized a company to develop his invention. It is composed entirely of practical mechanical men and they are all confident that their fortunes are made.

EASTERN FREIGHT REPORT.

Messrs. Funch, Edye & Co., New York, report the condition of the eastern freight market as follows:

The freight market generally continues in a depressed state, the demand for tonnage in all directions being very limited. Grain charters can only be effected at present market rates, new business being very difficult to put through, excepting on the basis of rates asked by the regular lines and whilst the supply of available tonnage continues equal to the demand, we do not look for any material change in rates. Both from the Atlantic cotton ports and the Gulf, charterers appear to be well supplied with steamers and show no disposition to make further commitments. There has been a little more chartering for timber tonnage, owing chiefly to owners reducing their limits, though the enquiry in this directions still continues limited.

The position of sail tonnage shows no appreciable change either as regards rates or activity.

SHIPPING AND MARINE JUDICIAL DECISIONS.

(COLLABORATED SPECIALLY FOR THE MARINE RECORD.)

Shipping—Landing Scow on Rocky Beach—Charterer's Risk.—A charterer of a scow, which at his instance made a landing at an unusual place, with which the master was acquainted, must be held to have assumed the risk of such landing, and is liable to the owner for an injury received from striking upon rocks near the shore without the fault of the master. Fox vs. Damm, 105 Fed. Rep. (U. S.) 254.

Action for Services of Tugboat—Quantum Meruit—Measure of Recovery.—On a question of quantum meruit for the services of a tugboat, it was not improper to allow plaintiffs suing therefor to prove, as one of its running expenses, the amount and value of coal required for a trip, or to allow them to ask their witness whether the boat could "earn a livelihood" at prices less than were charged. Syson et al. vs. Hieronymus et al., 28 So. Rep. (Ala.) 967.

Marine Insurance—Proceeds of Wreck—Erroneous Distribution.—After a ship had partially loaded, both vessel and the cargo loaded were badly damaged by fire at the wharf, and were sold in salvage proceedings. Charterer had made advances of inland freight on the cargo, for which it had a lien thereon. In distributing the proceeds in the salvage suit, a cargo owner received an overpayment, which should have been applied on such freights. Held, that, as between the charterer and the insurer of its freight advances, the former must bear the loss, if any, resulting from such erroneous payment, although neither were parties to the salvage proceedings; such loss being one not covered by the policy, and there having been no abandonment to the insurer which charged it with the duty of looking after its distribution of the fund recovered. The Clintonia, 105 Fed. Rep. (U. S.) 256.

Shipping—Injury of Stevedore's Employee—Defective Appliances.—Libellant's intestate, employed by stevedores in loading a ship, stepped upon a hatch cover, which tilted, and he fell through into the hold, receiving injuries from which he died. A steel coaming, over three feet in height, surrounded the hatchway, having a flange on the inner side, upon which the covers rested, and it appeared that such coaming had become bulged outward opposite the cover which gave way, so that such cover did not reach the flange or have a secure footing thereon. The weight or evidence, however, showed that the vessel, which was new, and all its appliances, were in good condition when it was delivered to the stevedores for loading, and that the bulge in the coaming was caused by their negligence in permitting slings of cotton bales to strike against it in loading, which had proceeded but about four hours before the accident occurred. Held, that the owners were not guilty of any negligence which rendered them liable for the death, in the absence of proof that they or their agents had notice of the defect, and time and opportunity to repair it. Roymann vs. Brown et al., 105 Fed. Rep. (U. S.) 250.



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 regarded.

CLEVELAND, O., FEBRUARY 7, 1901.

LET it be clearly understood, that subsidy or no subsidies,
 the same keen scent will be kept up for the higher cent
 procurable on freights.

A LOT of misleading opinions and almost sworn-to state-
 ments have been set forth regarding the increased cost of
 handling, that is, managing and sailing United States as
 against foreign tonnage. Where there is full and plenty
 and no waste observed in each department, strict discipline
 steadily enforced, and the most rigid economy practiced in
 all the affairs of the management the American can be
 trusted to come out as level financially, as similar tonnage
 belonging to any other nation.

CHICAGO may now proceed to show that there is no level
 so true as a water level, that even if several other immense
 drainage canals were opened at the head of the lake, the
 water would still remain level, moreover, that the indraught
 at the entrance to the port, if any, results in the greatest
 possible benefit to general commerce, furthermore, that the
 current in the river created by the flow of water through
 the canal was designed to and actually does facilitate the
 smart handling of tonnage in the creek, finally, that the out-
 lay of thirty to forty millions of dollars was mainly from a
 humanitarian and philanthropic standpoint, with a view to
 permitting the residents and water users below Lockport
 having free access to the unadulterated waters of Lake Mich-
 igan flowing in the vicinity of Chicago.

A NEW bridge is to be placed at Saginaw, Mich., and the
 same situation that existed at Lorain, O., now confronts the
 people of Saginaw. We have been asked our opinion in the
 matter, and strongly contend for a bridge of the latest and
 best type, one of the most approved non-obstructive kind.
 The Secretary of War should veto any plans for center pier
 bridges in the future and insist upon the engineering talent
 devising viaducts that would be no impediment to safe, free
 and clear navigation. Chicago is condemning her center
 pier bridges and replacing same by modern reliable struc-
 tures, so also should all lake ports look to this end. The
 placing of the center pier is a permanent artificial obstruc-
 tion to the commerce using the channel or fairway, and on
 this ground alone, should, or could be condemned of the
 district officer of the Corps of Engineers, U. S. A., having in
 charge the conservancy and improvement of rivers and har-
 bors within his local jurisdiction. It is to be hoped that our
 Saginaw friends will keep in the van of improvements and
 build not only for the necessities of the day, but a little in
 advance, certainly no lake port has any excuse for going
 back to the obsolete center pier bridges of ages ago. Much
 more might be advanced in favor of modern style bridges
 crossing our waterways; but a word to the wise is sufficient,

COMMEND us to Senator Hanna's ideas of legislation on
 the conservancy and improvement of rivers and harbors by
 the Federal Government. Whatever expenditures are incurred
 by the general government must be for the good of the
 whole union and not for any particular state or locality. The
 city of Cleveland now desires a very marked extension of its
 eastern breakwater, not as a harbor of refuge for the general
 commerce of the lakes but more particularly to protect the
 shore line and eventually, perhaps, to facilitate the building
 of wharves to be used as private and personal interests might
 dictate. The Cleveland harbor of refuge is a good deal of a
 misnomer anyway, a few of the Bessemer boats desiring to
 lie in the outer harbor last summer found it inconvenient, if
 not actually unsafe, to swing to their anchors either in the
 east or west bight of the harbor, accordingly they moored
 temporarily to the billion dollar breakwater only to be
 ordered away from making fast to a government construc-
 tion (we had almost said obstruction) so they up stick and
 cleared for Erie, Pa., to seek safe and proper moorings.
 Senator Hanna objects to the Federal Government paying
 out many more millions of the people's money for the exten-
 sion of such questionable harbor and mooring facilities, and
 on no other grounds can these sums be asked for. It is our
 desire to see the port of Cleveland receiving all the Federal
 aid that she is justly entitled to, but, as Senator Hanna
 evidently perceives, there is a limit. To put the matter as
 concise as possible, we may say, that because Mr. Capitalist
 agrees to build a \$50,000 wharf to handle his own business
 he can make a dicker with Uncle Sam for a five million
 dollar protected dyke.

IT WILL be almost a national calamity if the river and
 harbor appropriation bill is held up at this session of Con-
 gress. The Senate has been kept closely to the ship sub-
 sidy bill, and told in as many words to enact that piece of
 legislation at this term, or go without harbor improvements.
 It is to be regretted that so much personalism has been per-
 mitted to creep in and around, above and below the subsidy
 measure. The country is fully aware of the necessity of
 building up a merchant marine commensurate with the vast-
 ly increasing importance of our over-sea traffic and interests,
 but now the opinion has got abroad that there is a "pirate
 in the wood-pile," and that the subsidy bill simply means to
 further enrich the already rich and powerful. As a matter
 beyond the slightest prevarication, the subsidy bill is the
 best for the interests of the country that could possibly have
 been drawn up. There are, of course, modifications and
 amendments which would show themselves from time to
 time, yet all within the power of Congress to regulate. In
 so inclusive, extensive and somewhat original a piece of leg-
 islation there was bound to be wide differences of opinion,
 but, with earnest, sincere and faithful work, many of these
 angular set-backs might have been got around with a mutual
 amicable understanding bearing upon the main points in the
 legislation. At this writing, the fate of the measure hangs
 trembling in the balance, so to speak, with the added incu-
 bus, that if it does go through, it will prove to be an unpop-
 ular measure at the present time.

BIDS were opened by the Navy Department in Washing-
 ton last week for the construction of three protected cruis-
 ers. Naefie & Levy of Philadelphia bid for one cruiser at
 \$2,741,000; the Newport News Shipbuilding Company at
 \$2,741,000, and the Bath Shipbuilding Company at \$2,750,-
 000. A fourth bid was from the William R. Trigg Company
 of Richmond, Va., one cruiser at \$2,780,000 or two at \$5,440,-
 000. These three cruisers are designed to be the most for-
 midable vessels in the world of their class. They will resem-
 ble closely the type of second-class armored cruisers. The
 new vessels are to be named the St. Louis, Milwaukee and
 Charleston, the last two continue the name of the ship
 wrecked November 2, 1899, in the Philippines. Their trial
 displacement will be about 9,700 tons each, they will be
 equipped with 21,000 horse-power, twin screw engines and
 will have a speed of 22 knots per hour. The vessels will be
 424 feet in length and 66 feet in extreme breadth. Their
 bunkers will have a capacity of 1,500 tons of coal.

DEMURRERS in the Chicago drainage canal suit have been
 overruled by the United States Supreme Court and the trial
 may now proceed on its merits. The action was brought by
 the State of Missouri against the State of Illinois and the
 drainage trustees, and virtually seeks an injunction against
 the use of the canal, on the ground that it pollutes the
 water supply of St. Louis.

TRANSFER OF MAJOR SEARS.

Major Clinton B. Sears, United States Engineer in charge
 of river and harbor improvements on Lake Superior, has
 been ordered to the Philippines. His instructions are from
 Adjutant General H. C. Corbin directing him to proceed to
 Manila at once and report to the commanding general of
 the division. Major D. W. Lockwood, Corps of Engineers,
 U. S. A., of St. Paul, has been directed to proceed to Duluth
 and receive the office from Major Sears. The appointment
 of Major Lockwood is only temporary, however, and later
 the announcement of another engineer will no doubt be
 made for the Lake Superior district.

The transfer of Major Sears to the Philippines or any
 other point at this time comes in the nature of a surprise.
 It was expected that he would at least be allowed to com-
 plete the Duluth ship canal piers in which Duluth people
 take much pride. Two years ago Major Sears was ordered
 to Porto Rico to occupy an important position, but it was
 countermanded through the influence of Secretary of War
 Alger, who happened to be in Duluth at the time. General
 Alger was called upon by a large delegation of leading
 Duluth men and at their request he exerted his influence to
 not disturb Major Sears at that time.

The announcement, therefore, that Major Sears was trans-
 ferred was received with regret by Duluth people, as it will
 no doubt by the majority of lake interests. His services
 have been highly appreciated, and it has been generally
 understood among business men that when the right time
 should come a public expression of the esteem in which he
 is held, and recognition of his distinguished services should
 be made. This idea was inspired largely on account of the
 splendid piers for the ship canal for which Duluth is largely
 indebted to the major. He saved enough money out of the
 awarding of contracts under the continuous contract system
 for the improvement and conservancy of the Duluth-
 Superior harbor to build the piers. The difference between
 the estimates and the contract figures represented the price
 of the structures, about \$500,000.

The sudden transfer to the Philippines will not deprive
 him of the recognition which Duluth people have proposed
 he shall have for his services here. There is already a move-
 ment on foot for a testimonial of some kind and it is likely
 that a meeting will be held in the very near future at which
 the plans will be outlined.

Major Sears has a splendid army record and is considered
 one of the best engineers in the service. He is popular with
 his subordinates and his going away will be much regretted.
 He has been stationed here a little more than eight years
 and during that period has had constantly in hand improve-
 ments of great importance at various Lake Superior points.

MARITIME CONGRESS AT BRUNSWICK.

The National Maritime Congress concluded its business
 on Jan. 31 with the indorsement of government aid to
 American shipping and the creation of a permanent organ-
 ization, and adjourned sine die. After discussion by several
 members, a resolution on the ship subsidy question was
 adopted as follows:

"That this is a national business proposition, outside of
 politics, therefore it is our opinion that it is the duty of Con-
 gress, before the adjournment of the present session, to re-
 vive our shipping upon the seas by Governmental aid to
 American mail carriers and traders, equitably distributed,
 sufficient in amount to enable them to successfully compete
 with the cheaper built, cheaper operated, subsidized and
 bountied merchant ships of foreign countries in the carrying
 of our imports and exports."

A permanent organization was effected by the election of
 these officers: President, A. K. Miller, of New Orleans;
 Vice-President, C. D. Ogg, of Brunswick; Treasurer, E. P.
 Wilson, of Cincinnati; Secretary, F. B. Thurber, of New
 York.

VESSELS CLASSED.

Vessels classed and rated by the American Bureau of Ship-
 ping in the "Record of American and Foreign Shipping."
 American screw, Hawaiian; screw, City of Washington;
 ship, Diamond Head; 3-mast schooners, Seguin and Nellie M;
 schooners, Oakley C. Curtis and Edith G. Folwell; half
 brig, L. F. Munson.

THE Hopper dredge La Puissante, has been lately built
 for use at Port Said, on the Suez canal. This machine will
 dredge to the depth of 40 ft; it is built of steel, with 23 wa-
 tertight bulkheads, is 226 ft. long, 47 ft. beam and 19 ft.
 draft. The hopper capacity is 2,200 tons of dredged mater-
 ial; and the buckets hold 30 cubic ft. each, and these may
 be operated at the rate of either 16 or 20 per minute. The
 contract dredging capacity is 1,150 tons per hour; but it is
 stated that she dredged 1,600 tons in this time.

THE THICKNESS OF BOILER SHELL PLATES.

How thick may the shell of an ordinary externally-fired return-tubular boiler be safely made? This question is discussed by Robert S. Hale, M. Am. Soc. M. E., in a circular recently issued by the Mutual Boiler Insurance Co., of Boston, and he advises that the thickness of shell plates in such boilers, and hence the size, and the steam pressure, may be considerably increased over the present usual practice without any danger. As proof of the faith that is in him, he states that his company stands ready to insure boilers with shell plates 9-16 inches thick. This thickness, with joints quadruple-riveted, will permit 170 lbs. pressure to be carried on a 72-inch boiler with a factor of safety of 5, or 135 lbs. pressure on a 90-inch boiler. He estimates the cost of a 90-inch boiler complete with setting at \$2,000, and shows that with a rating of 400 horse-power this cost is only \$5 per horse-power.

It will be evident that the larger a boiler of this type can be made, the lower will be its cost per horse-power. The reasons for limiting the thickness of shell plates in the past has been the prevalent theory that a thicker plate offered more resistance to the transmission of heat and rendered the plate more liable to overheating and consequent injury. As Mr. Hale correctly shows, this theory is erroneous. He computes (from the known conductivity co-efficient of iron) that a plate so thick as 1 inch, transmitting heat so rapidly as to evaporate 50 lbs. of water per hour from and at 212°, will have a difference of temperature between its two sides of only 168°. Assuming, then, a steam pressure of 150 lbs., corresponding to a steam temperature of 365°, Mr. Hale concludes that the temperature of the fire side of the plate will be only $365^{\circ} + 168^{\circ} = 537^{\circ}$.

In this computation, however, says the Engineering News, New York, Mr. Hale has made one error. He has omitted to include the difference in temperature between the water side of the plate and the boiling water in contact with it. It is true that under low rates of heat transmission this difference is in all probability only a few degrees; but exactly how much it is we do not know, and no experiments have ever determined. What we do know is that this difference varies with the rate of heat transmission, and also with the speed of circulation of the water over the surface of the plate, perhaps also with the violence of the ebullition which induces circulation. In what proportion it varies is, however, unknown. Practical experience indicates that while with all ordinary rates of heat transmission the heating surface can take care of itself, when the fire side of a plate is exposed to very high rates of combustion, the difference in temperature between the plate and the water may reach a considerable amount. It is, therefore, necessary in such cases to take especial care that rapid and continuous circulation shall not be interrupted, that free escape for the steam bubbles is provided, and that grease or scale or dirt does not interpose a non-conducting layer between the plate and the boiling water. As a practical illustration: it makes little difference what the circulation is around the smoke-box end of locomotive boiler tubes, whereas even with the best of care the tubes near the fire-box end gradually become overheated and burned away.

A NEW MARINE INSURANCE COMPANY.

Through the instrumentality of Chubb & Son, of New York, the Federal Insurance Co. has been organized under the laws of New Jersey, with a capital of \$500,000 and \$500,000 surplus, to engage in the marine and fire business. The management of the company will be in the hands of Chubb & Son, with a board of directors chosen from the New York marine underwriters. The new corporation will practically be a New York marine insurance company and the only one in that state. Lake and ocean risks are to be assumed.

CHICAGO BRIDGES.

Drawbridges of the bascule type are at the present time somewhat exceptional, being only used, as a rule, under somewhat special conditions. Within the next few years, however, bridges of this type will be somewhat numerous at Chicago, in consequence of the policy adopted by the city authorities for improving the river. Among the important improvements decided upon for improving the navigation and increasing the flowage capacity to the drainage canal, is that of removing the present swing bridges and their pivot piers, and replacing them by bascule bridges, having no center piers to obstruct navigation or flow. The navigable portions of the river are now crossed by 58 drawbridges, of which 8 are for railways exclusively, and 2 for both street and rail-

way traffic. These two latter carry Lake Street and the Lake Street Elevated Ry., and Wells street and the Northwestern Elevated Railway, respectively. Of all these existing drawbridges, 50 are swing bridges (all but one—the C. & M. & St. P. Ry.—having center piers); one is a verticle lift bridge (at Halsted St.); two are folding bridges (at Weed street and Canal street), and 5 are bascule bridges. The present scheme of improvement provides for the replacement of 12 swing bridges with as many bascule bridges.

CAPT. J. S. DUNHAM.

Capt. Dunham, who passed away on Thursday, was one of the best known vessel men on the lakes. He was elected president of the Lake Carriers' Association in 1898 and was always an active member of the association.

Capt. James S. Dunham, formerly president of the Dunham Towing & Wrecking Co. and probably the leading authority on matters of lake commerce in Chicago, died at his home, No. 29 Bellevue Place, early on Thursday morning. The end came unexpectedly as the result of angina pectoris, which attacked him shortly after midnight and caused his death in twenty minutes. About five weeks ago Mr. Dunham suffered a similar attack, since when he had been confined to his house most of the time. Tuesday, he felt so much better that he went out of doors for the first time since his illness began. Surviving Capt. Dunham are a widow, a son, Robert J., and two daughters.

Capt. Dunham always showed an untiring zeal in planning for the improvement of the Chicago river in the interest of the grain trade, and is to be credited with helping to bring



CAPT. J. S. DUNHAM.

about the great development of the commerce of that city through his efforts in these directions.

Capt. Dunham was born in Washington county, N. Y., in 1837. As early as 1851 he was in service on a steamboat on the Hudson river. In 1854 Mr. Dunham reached Chicago and engaged as an engineer on a tugboat. A year or two later he invested his savings in the then famous tugboat A. C. Gunnison, of which he was captain. In the fall of 1857 he went to New Orleans with his partner and there engaged in the towing business. Good fortune attended him in this port, but during the early part of that year the confederacy chartered one of his boats to go to Pensacola, Fla. Mr. Dunham went with her, was arrested as a union sympathizer and was sent back to Chicago. He then went to Philadelphia, where he built a tug, the Little Giant.

Chicago's possibilities for lake traffic had become plain to Capt. Dunham and he became the largest vessel and tug owner in Chicago. He founded the Dunham Towing & Wrecking Co., of which he became president. He was interested in the ownership of fourteen tugs, but in August, 1899, he disposed of these interests to the Great Lakes Towing Co. Soon after the Chicago fire he equipped one of his own tugs with pumps for fire service, and by its aid extinguished a conflagration in the lumber district. A month later the city followed suit and built its first fireboat.

Mr. Dunham married Miss Mary Ellen Brown, of Ashtabula, O., in January, 1867. He was aged 63 years.

RUSSIAN BUSINESS TACTICS.

The Detroit Free Press tells the following story of the experience of a naval architect and builder in bidding for a Russian contract:

"The Russian government had heard much of the success of the Ste. Marie, in service at the Straits of Mackinaw, and invited Frank E. Kirby, its designer, to make a bid on a craft of similar style, but much larger and more powerful. The first intention was to make her of wood, but investigation showed there was no suitable oak to be obtained within thousands of miles of the Lake Baikal port where she was to be put together, so steel was substituted. Mr. Kirby figured that many parts of the craft could be constructed at the Detroit plant and shipped to the Lake Baikal port, and the bulkier parts built in Russia and shipped there, the lake being inland. Having completed the plans, on which he put many months of hard labor, Mr. Kirby shipped them over with his bid, it being the universal custom to accompany all bids to build vessels with the plans thereof. Finally Mr. Kirby was sent for, and went to St. Petersburg. In the presence of the Russian officials he encountered a representative of the great Armstrong shipbuilding concern of England, perhaps the largest in the world, with a dock frontage as large as that of the city of Detroit. It soon became evident that all the astute Russians had been scheming for from the beginning was possession of the plans, for they began to hedge the contract about with provisions which made it practically prohibitive to the Detroit company. They demanded, among other things, that the American concern give bond of a Russian company or bank for the entire and faithful performance of its part of the contract, and that the boat must be completed on a certain date or the company pay an exorbitant penalty. This simply meant that the Detroit Dry Dock Co. would have to ship over a sum of money equal to a greater part of the price of the boat and deposit in a Russian bank as collateral for the bond. This exaction and the rigid nature of the Russian demands and penalties completely disgusted Mr. Kirby, and he refused absolutely to have anything more to do with it. This was exactly what the Russians and the Armstrong representative wanted. The big English concern had done a lot of work, giving Russian security, for that government, and immediately it accepted the terms and secured the contract, using the American's plans.

"A friend of Mr. Kirby who tells this story, says he saw Mr. Kirby just after he arrived back. The latter stated that life was made a burden for him all the time he was in Russia. The authorities took possession of all his mail and opened and read every letter before allowing him their possession. He was under as strict espionage as though he had been suspected of nihilism, or of having designs on the life of the Czar. After passing the border line of the country on his return home, he was so delighted at getting out of the place that he threw up his hat and yelled. The plans were worth from \$15,000 to \$20,000, from the standpoint of the shipbuilding expert, but to the Russian Government they were worth hundreds of thousands of dollars. Yet the dishonest emissaries of the Czar never offered him one cent for them; they simply confiscated them, for Mr. Kirby concluded that, although according to American law they were his property, there was little use in sending in a bill, as the payment would be refused, and a suit in a Russian court by an American against the Russian Government could have but one result. So the magnificent Baikal ice-crusher, the achievements of which are being written and talked about all over the civilized world, is the product of a barefaced robbery of the brain work of one defenceless Detroit man by the powerful Russian Government."—American Machinist.

STEAMBOAT OFFICERS ELECTED.

American Steamship Co.—Directors: James McMillan, W. C. McMillan, Hugh McMillan, William McMillan, of Port Huron, and Maurice B. McMillan. Officers will be elected later.

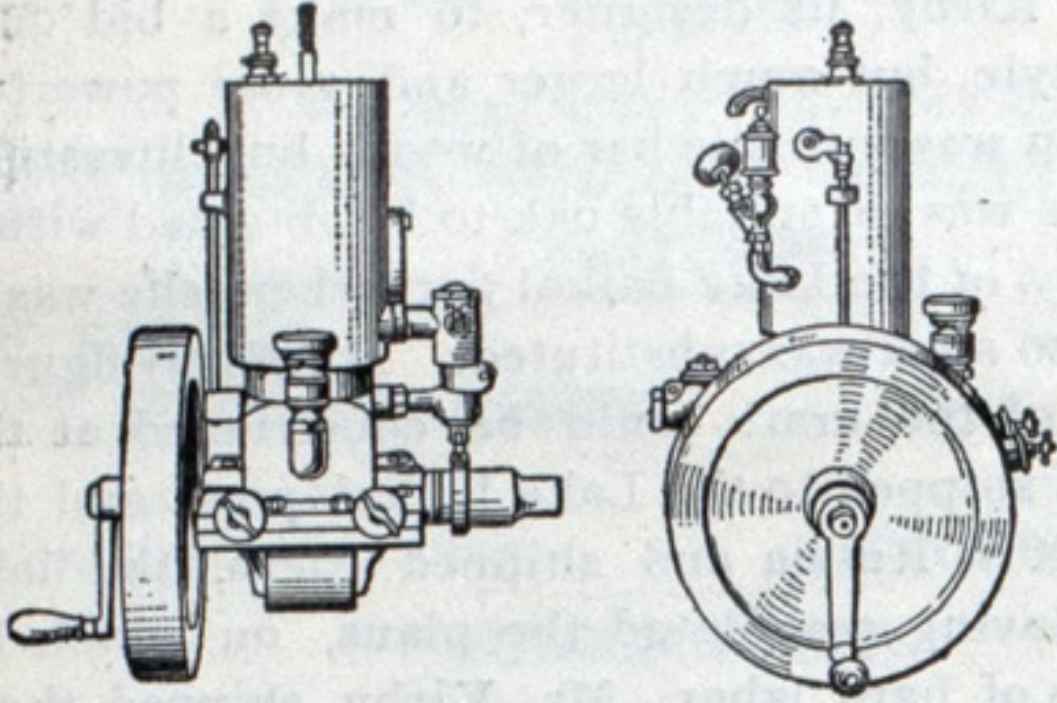
Wolverine Steamship Co.—President, J. B. Roby; vice-president, W. M. Freer; secretary, treasurer and manager, A. McVittie. The officers, with F. J. Hecker and James McMillan, are directors.

Vulcan Transportation Co.—President, E. T. Peck; vice-president, J. B. Baugh; second vice-president, S. A. Baugh; secretary and treasurer, James Findlater. The officers are the directors.

Swain Wrecking Co.—President, L. C. Waldo; vice-president, J. L. Quinn; treasurer, B. W. Parker; secretary and manager, A. A. Parker. These officers and Martin Swain are the board of directors.

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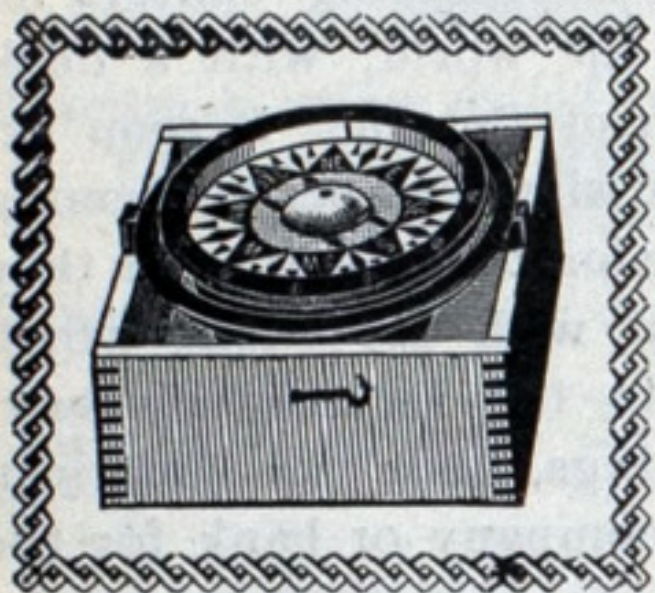
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THE CALUMET AND HECLA MINES.

Calumet and Hecla rock is very hard to stamp, according to the Boston News Bureau. The mine absorbs millions of dollars worth of timber, and notwithstanding twenty years of experiments, one of the greatest copper mines of the world exists in the Calumet and Hecla tailings, which contain more than three-quarters of 1 per cent. to the ton of rock stamped.

There are 22,000,000 tons of these copper-bearing sands which have been thrown out from the Calumet and Hecla stamp mills, and at one time they sampled eighty-seven hundredths of one per cent. in copper, although of late, by dressing the "mineral" lower in its percentage of copper, the per cent. of copper in the tailings has been reduced to six-tenths of 1 per cent. But in these dumpings is at least an average of three-quarters of one per cent. copper, which at 17 cents per pound has a gross value above \$50,000,000—and yet is not worth 50 cents. From five to ten people are at work every year on the problem of recovering this value and the next generation may find its Edison or Pupin to reclaim this copper.

It is a remarkable fact that mines at Lake Superior pay dividends from soft rock yielding no greater percentage of copper than is contained in these Calumet and Hecla tailings.

DOMINION FISHERIES.

The annual report of the Dominion Department of Fisheries, which has just been published, shows that no less than 70,863 men were last year earning their living by exploiting Canadian waters, using 5,506,760 fathoms of nets and other fishing gear, representing a capital of \$10,000,000. Nearly 1,200 schooners and tugs manned by 8,970 sailors, as well as 70,893 other fishermen, using over 38,000 boats, found occupation in this vast industry. The lobster plant alone is estimated at \$1,334,180, comprising 858 canneries, dispersed on the seaboard of the maritime provinces. No less than 18,708 persons found employment in this branch of the fishing industry, using over 1,360,000 traps. The salmon preserving industry in British Columbia, comprising 69 canneries, and representing a capital of \$1,380,000 gives employment to 18,977 hands. The amount of capital invested in the fisheries last year exceeded that of the year previous by \$289,743, and 719 more men were engaged in the industry. The total value of the catch of fish in Canada for the year amounts to \$21,891,706, being an increase of about \$2,250,000 over the preceding year.

MICHIGAN VESSEL TAXATION.

Michigan vesselmen are interested in proposed legislation introduced in the Senate yesterday afternoon. A new taxation measure, fathered by Senator Kelly of Muskegon, provides that the owner of any steam vessel, barge, boat, or other water craft, owned within or hailing from any port of

the state, and employed in the navigation of international waters, may escape all taxes, state and municipal, by the payment of a sum equal to three cents per net ton of the registered tonnage thereof.

In order to come within the provisions of the law the vessel owner must file with the state auditor a verified statement in writing, before July each year, containing the name, port of hail, tonnage, and the name of the owner of such steam vessel, barge, boat, or other water craft, and shall thereupon pay the tax into the state treasury. The state treasurer must, in his turn, pay into the county treasury of any county wherein is located the port of hail of any steam vessel, one-half of the money received on account of such vessel. The law is a radical departure in Michigan.

HULL INSURANCE RATES.

Although little has thus far been said concerning hull rates for the coming season, it is said that the London underwriters, who virtually control the business, have decided to maintain the rates and terms of last season. The hull business of 1900 proved very profitable to the underwriters, as the heaviest losses were in the main confined to fleets on which no insurance was carried. The vicissitudes of the business are such however, that the foreign underwriters feel disinclined to abandon the conservative course which they saw fit to pursue last season.

AUSTRALIA TO BLAME FOR MAIDA COLLISION.

Judge Ricks, of the United States court in Cleveland, has handed down a decision in the Maida-Australia-Italia collision case, which was tried before him two years ago. Judge Ricks holds the Australia entirely to blame in the collision, basing his decision on the finding of the Australia's anchor, which, he says, locates beyond a doubt the position of the boats in the mix-up. The three boats were tied up in a bunch in the Little Rapids cut at the Soo, two years ago last summer, and the result was heavy damages for the Maida. Harvey D. Goulder, Esq. of Cleveland represented the owners of the Italia; Hoyt, Dustin & Kelley represented the Maida, and Shaw & Cady the Australia.

RAILROADS ACTIVE IN THE WEST.

The Wisconsin, Michigan & Northern road is doing the heaviest business this month in their history, is the statement made by the general passenger and freight agent J. C. Fitzgerald, in answer to the inquiries. The road is hauling thirty carloads of logs into the twin cities daily, and great quantities of freight from the west.

Mr. Fitzgerald believes that the new management of the road, with unlimited capital behind them, will make some big improvements in the spring.

At the annual meeting to be held February 26th, some plans will be made regarding the extension of the road.

Winter Mooring

A small book of about 32 pages, containing alphabetically arranged lists of steam and sail vessels, also tugs, showing where each one is located for the winter. This little booklet may be had by enclosing 10 cents in stamps to

The Marine Record Publishing Co.

WESTERN RESERVE BUILDING,
CLEVELAND, OHIO.

ASBESTOS.

The H. W. Johns Manufacturing Co., New York, with branches at several of the principal cities in the United States send out to the trade a neat little brochure on asbestos.

Asbestos is a fibrous mineral and one of nature's unique products. It is found in various parts of the world and usually occurs in narrow veins or seams. When treated mechanically it yields soft, white, delicate, and exceedingly strong fibres, which can be spun, woven, and otherwise manufactured into many useful articles. In addition to its fire-proof qualities, it is acid-proof and is practically indestructible. It also forms a valuable insulation for electrical purposes.

For purity of material, flexibility and adaptability of structure, combined with general completeness in design, looking to efficiency with durability, the Johns Co. claim their asbestos materials are easily superior to all others.

The fact that in recent years the pressure in steam engines, boilers, pumps, etc., has increased to such a marked extent, has necessitated the use of a packing possessing not only great strength, to resist this pressure successfully, but a material which is also proof against destruction by the resulting intense heat.

Formerly rubber, jute, cotton or hemp packings answered the purpose, but now a material of entirely different composition is necessary.

Asbestos is the ideal material for this use, resisting heat absolutely without expansion or contraction, due to changing temperatures, unaffected by continual exposures to oils or moisture of any sort and proof against deterioration by friction.

Expressions of sympathy are heard for Capt. Sullivan, of Toledo, who lost his wife very suddenly last week. Mrs. Sullivan left five children varying in age from two weeks to fourteen years.

DANGER FOR LAUNCH BUILDERS AND OWNERS.

The attention of our readers is called to a bill introduced in Congress on Dec. 14, 1900, and which has been referred to the Committee on the Merchant Marine and Fisheries. On Dec. 4, 1895, Senator Perkins, of California, presented a bill to the Senate providing that vessels using for their motive power naphtha, gas or fluid should carry licensed engineers and pilots, and have their hulls and machinery examined as if they were steam vessels. This bill met with the greatest opposition everywhere, not only from the builders of launches, but also by their owners, and the Committee on Commerce at once changed it in such a manner that vessels under 15 tons were exempt. On March 2, 1896, the Senate passed the bill, but when it reached the House of Representatives the public opposition proved so great that no action was taken until Jan. 11, 1897, when the bill was finally passed. It would have been impossible to get this bill through had not the change been made. The bill now offered by Chas. H. Grosvenor, of Ohio, has for its ultimate end to bring all pleasure power boats propelled by electricity, gas, fluid or naphtha under the same laws that govern steam vessels. It does not seem possible that Mr. Grosvenor understands the situation, and we do not believe the original act of Mar. 2, 1896, will be amended. However, it is always the unexpected that happens, and we therefore urge everyone of our readers to make this a personal matter and to protest against this offensive and dangerous action. Every yacht club and boat owner in the country should write to their Congressman at Washington immediately and enter a formal remonstrance. It is a matter of record that as a general thing legislation has been unfavorable to yachting interests in the past. The sport has now become national as well as international, and supports some of the greatest industries in the country. Millions of dollars are now invested in small power-driven craft alone, and the passage of this unnecessary and absurd law might deal a death blow to some of the largest establishments in the United States. The idea of compelling the owner of a launch of small tonnage to carry a pilot and an engineer is too ridiculous for serious consideration.—Forest and Stream, New York.

HOW BRITANNIA RULES THE SEA WITH SUBSIDY.

Apropos the subsidy question, interesting information has been brought to light: Great Britain has paid in postal subsidies to British ships the enormous amount of \$240,000,000 during the past sixty years. During the year 1897—the last official record—Great Britain paid British ships \$3,854,715 for carrying her mails abroad, which was \$3,279,375 more than the British government received for sea postage on those mails. This disposes of the assertion, frequently made, that Great Britain does not subsidize her shipping, but that her payments for mail carriage was purely a matter of business. Great Britain will not send her mails abroad by foreign ships, unless the writers distinctly specify on the envelopes that they desire their mails carried by other than British ships. A contract was once let to the North German Lloyd Steamship Co., by the British government, for the

carriage of British mails from Southampton to New York, at a rate about one-half of what Great Britain was then paying to the Cunard and White Star lines. But the opposition to this policy was so strong that the British government was forced to cancel the contract.—The National Magazine for February.

NOTES.

"GRAPHITE as a Lubricant," is the title of a most attractive booklet of 44 pages, 5½x7 inches, issued by the Joseph Dixon Crucible Co. It is very much of an old friend in a new dress—and a becoming one. There is some new matter and some new thoughts in the pages, but the testimony as to the value of graphite is much the same as the publishers have presented before. It is such capital evidence and covers such a wide field that they did not think new witnesses necessary, although the latter could have been found in plenty. The publishers will gladly send a copy of the booklet to anyone interested in better lubrication. It is well worth the reading.

COUNSUL WINTER reports from Annaberg as follows: During the past ten years shipbuilding in Germany has become a great industry. Old wharves have been torn away and new and larger ones constructed in their place. The present capacity of all the wharves does not meet the demands of the German merchant marine. Many orders must still be placed in foreign countries. At present twenty-two ships are being built in England for Hamburg alone. During the first half of last year, the dock owners and shipbuilders of Stettin, Kiel, Flensburg and Bremen have increased their capital stock, on the whole, by \$1,378,000. Many new enterprises are being planned. In the neighborhood of Nordenham, on the Lower Wesel, large wharves are being projected. A wharf for Stralsund is being planned which will cost nearly \$1,000,000. It is also reported that a German-Belgian syndicate will build a wharf in Antwerp, under the auspices of the Bremen Vulcan works. The German merchant marine now numbers 1,209 steamers, of 2,159,919 tons.

NOT many people are aware of the large extent to which the replacement of tonnage is required for the mercantile marines of the world in consequence of losses at sea by wrecks, collisions and otherwise. Lloyd's Register shows that such losses for the twelve leading maritime nations of the world amount to nearly 1,000,000 tons per year on an average. During the fourth quarter of last year 53 vessels of 37,948 tons were abandoned at sea; 53 of 31,712 were broken up or condemned; 8 of 7,665 tons were burned; 24 of 19,361 tons were lost through collisions; 27 of 15,658 tons foundered; 204 of 126,118 tons were wrecked; 38 of 20,399 tons posted as missing; while 7 of 4,177 tons were lost from various causes. This makes a total of 414 vessels of 262,938 gross tons that were removed from the Register for the three months under consideration. The losses are more than covered by new vessels launched. It shows, however, that on an average about four vessels of 2,921 tons were daily lost through the causes above enumerated.

Government Proposals.

U. S. ENGINEER OFFICE, 1637 Indiana Ave., Chicago, Ill., February 4, 1901. Sealed proposals for dredging in Chicago harbor will be received until 12 noon, central time, March 12, 1901, and then publicly opened. Information furnished on application. J. H. WILLARD, Maj., Engrs. 6-9

U. S. ENGINEER OFFICE, Galveston, Tex., January 28, 1901. Sealed proposals for building hull and machinery of self-propelling hydraulic dredge, will be received here until 2 p. m., February 28, 1901, and then publicly opened. Information furnished on application. C. S. RICKE, Capt., Engrs. 5-8

U. S. ENGINEER OFFICE, Buffalo, N. Y., January 25, 1901. Sealed proposals in duplicate for construction of concrete superstructure on breakwater at Buffalo, N. Y., will be received here until 11 a. m., February 25, 1901, and then opened. Information furnished on application. T. W. SYMONS, Maj., Engrs. 5-8

U. S. ENGINEER OFFICE, Pittsburg, Pa., February 7, 1901. Sealed proposals for completing two locks and dams and building four locks and dams on Monongahela River, above Morgantown, will be received here until 12 M., March 9, 1901, and then publicly opened. Plans may be seen here. Information furnished on application. C. F. POWELL, Maj., Engrs. 6-9

SEALED PROPOSALS will be received at the office of the Light-House Board, Washington, D. C., until 2 o'clock, p. m., March 2, 1901, and then opened, for furnishing the materials and labor of all kinds necessary for the construction and delivery of the twin-screw, steel, steam light-house tender Larkspur, in accordance with specifications, copies of which, with blank proposals and other information, may be had upon application to this office, or at the office of the Light-House Inspector, Tomkinsville, N. Y. F. J. HIGGINSON, Rear Admiral, U. S. N., Chairman. 5-6



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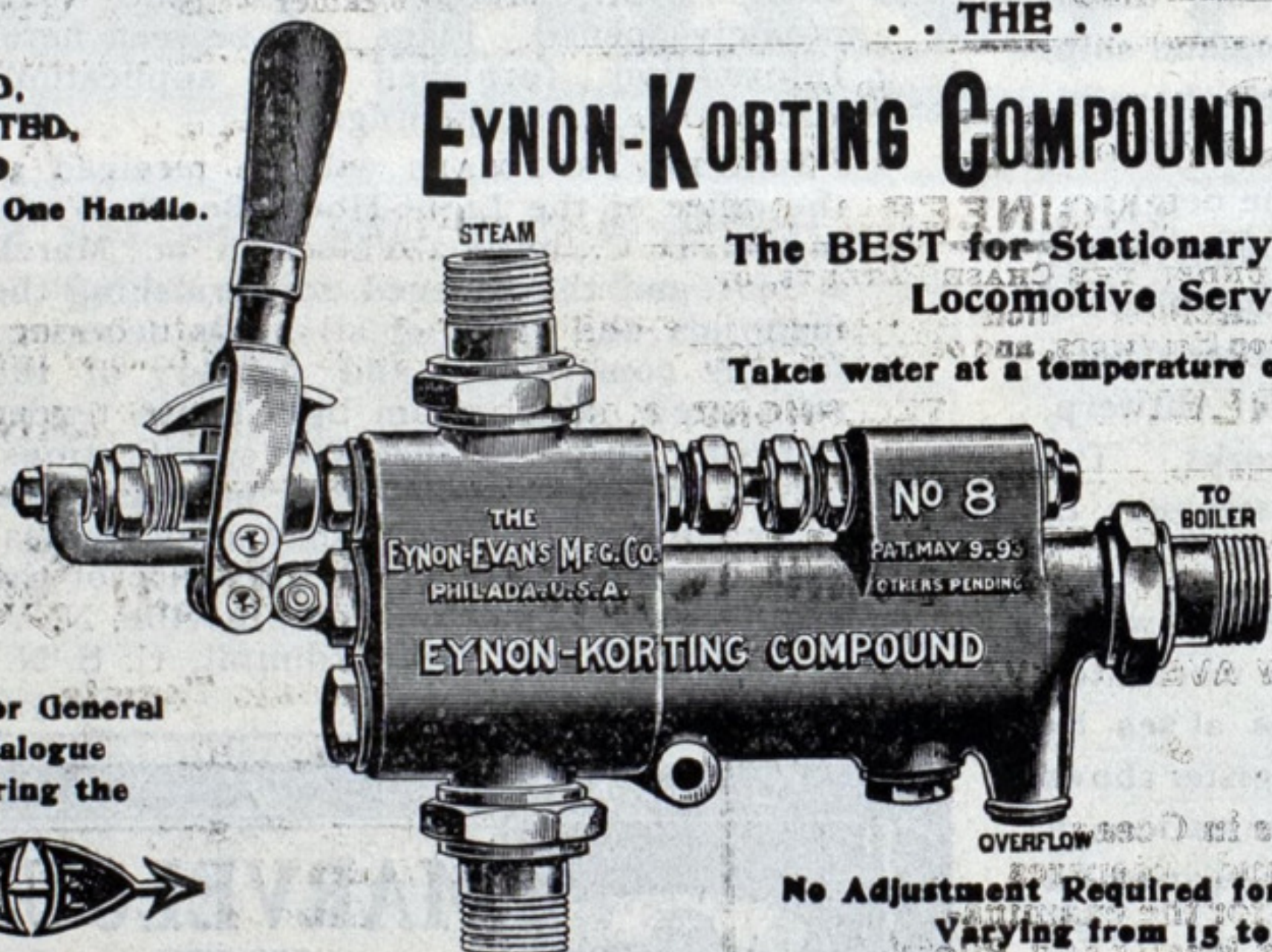
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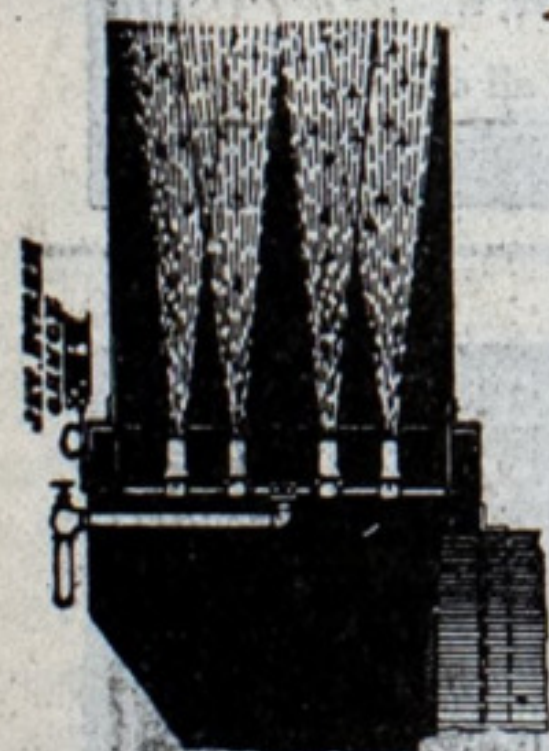
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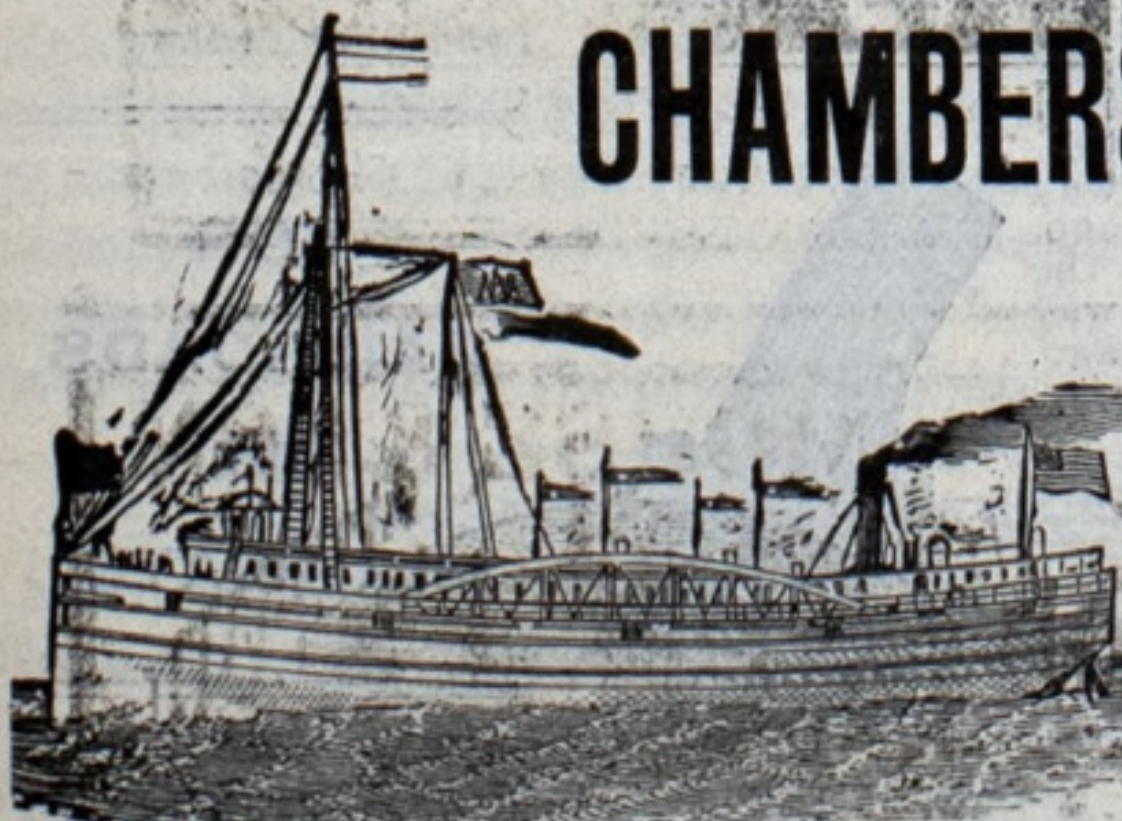
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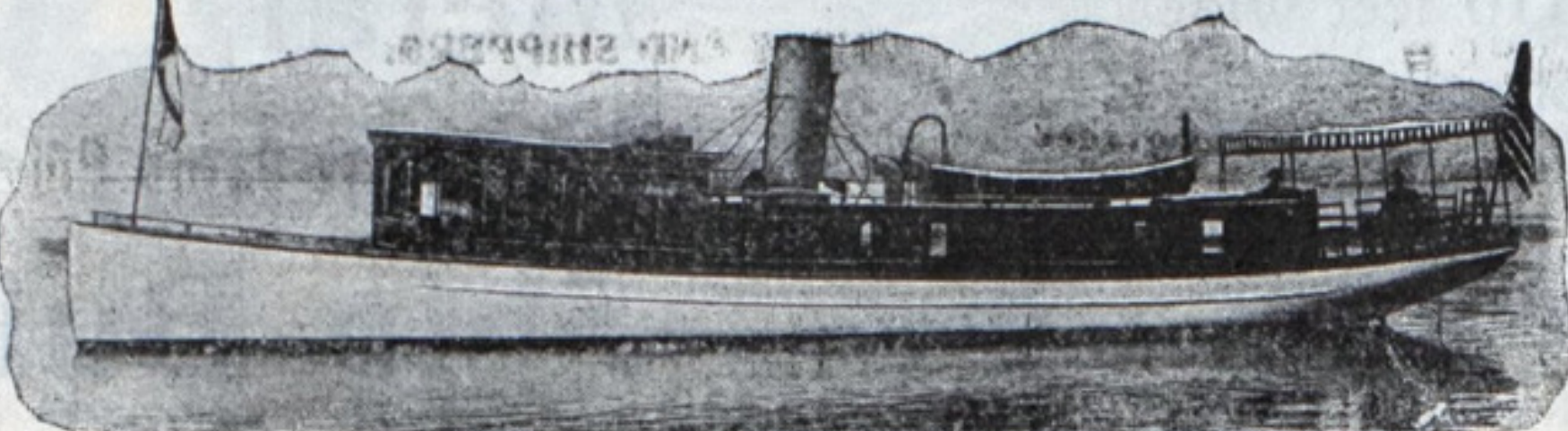
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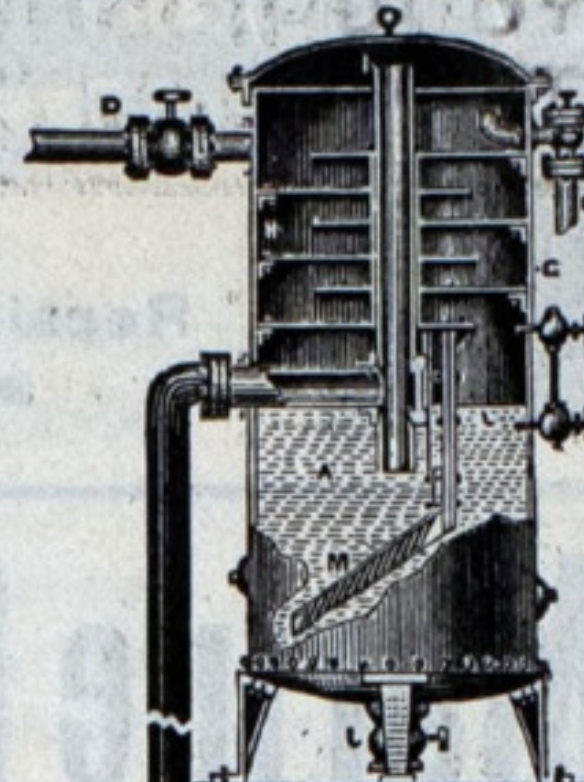
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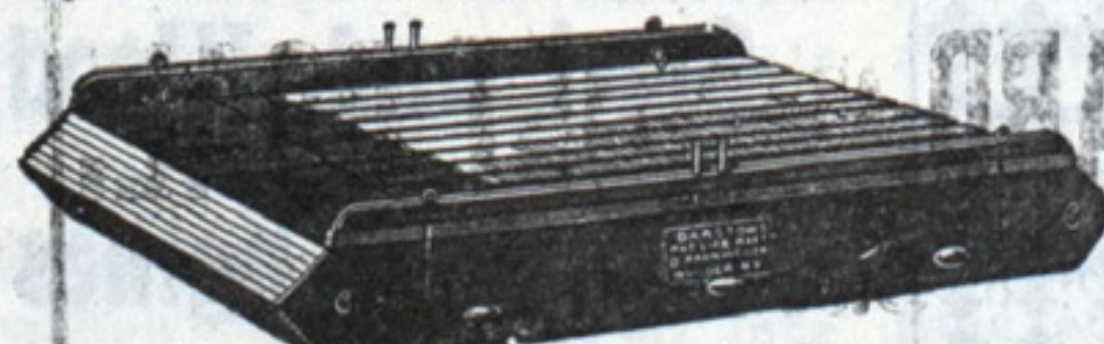
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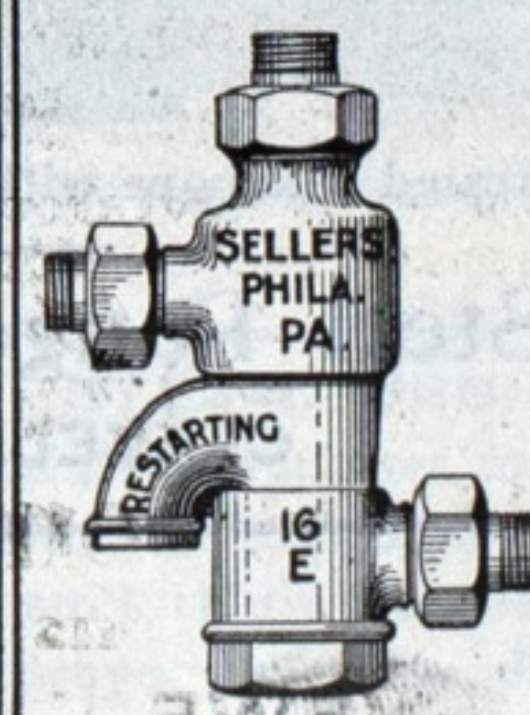


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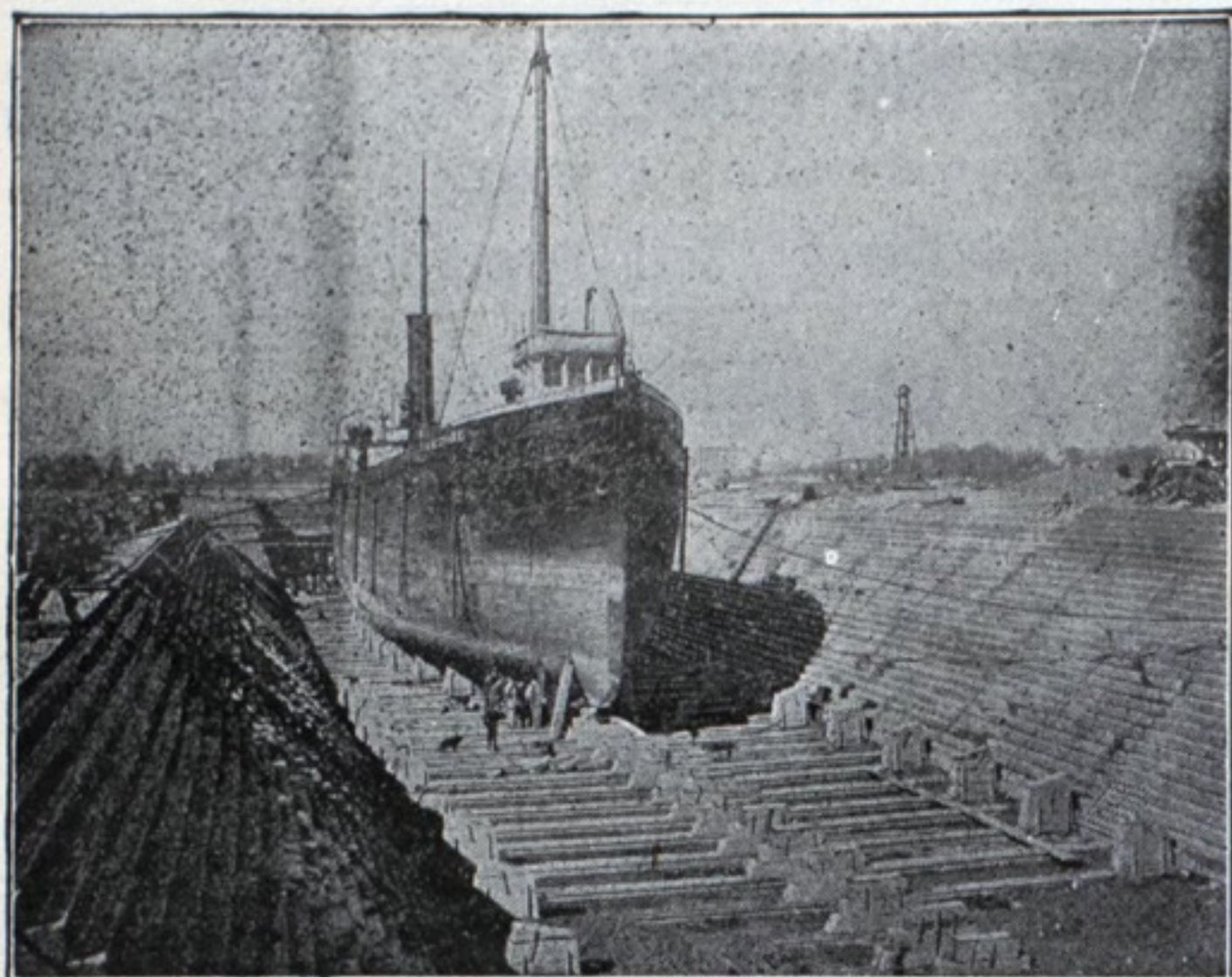
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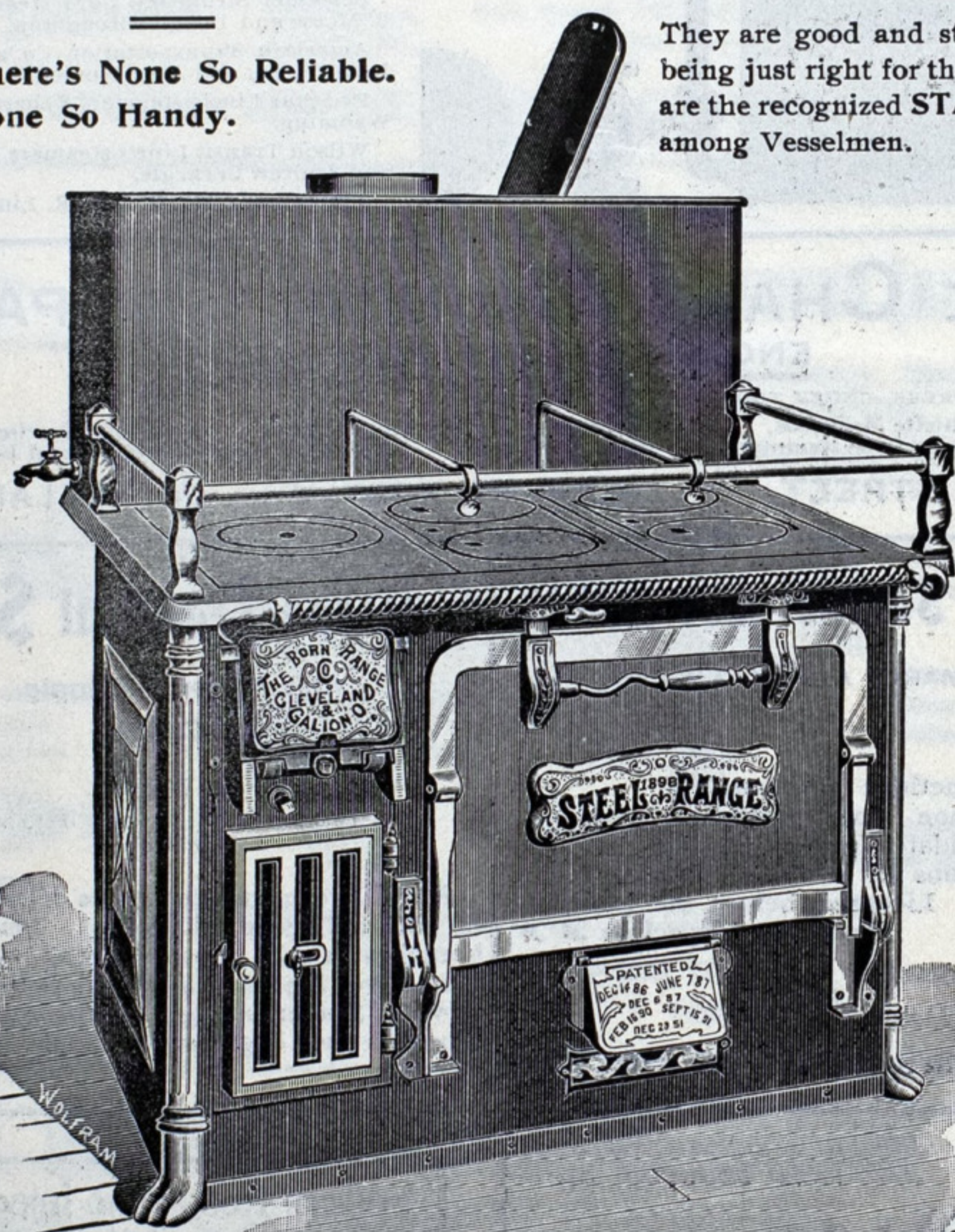
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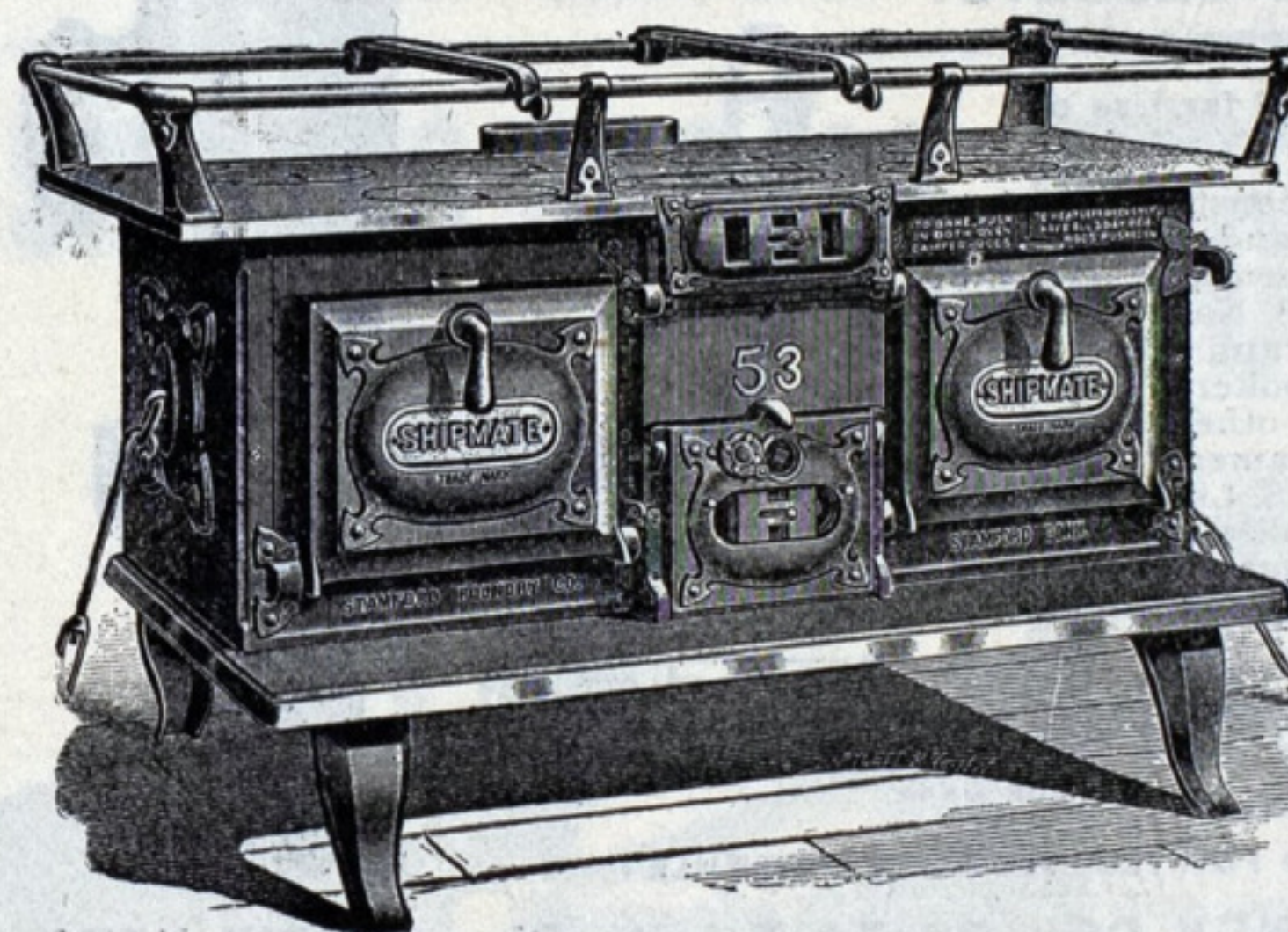
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